



# **DLM-DE**

## **Digital Land Cover Model for Germany**

Implementation status and future application

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# DLM-DE

## Digital Land Cover Model for Germany

1. Motivation, Concept DLM-DE
2. Workflow, Pre-processing
3. Implementation, Action Items
4. Perspectives and Planning



- to **provide** the reference data for the Spatial Data Infrastructure for Germany (GDI-DE) in collaboration with federal states and industry
- to carry out applied **research** and technological development
- to **represent** Germany on the international level in cartography and geodesy
- => BKG has role as **data provider** and **user**





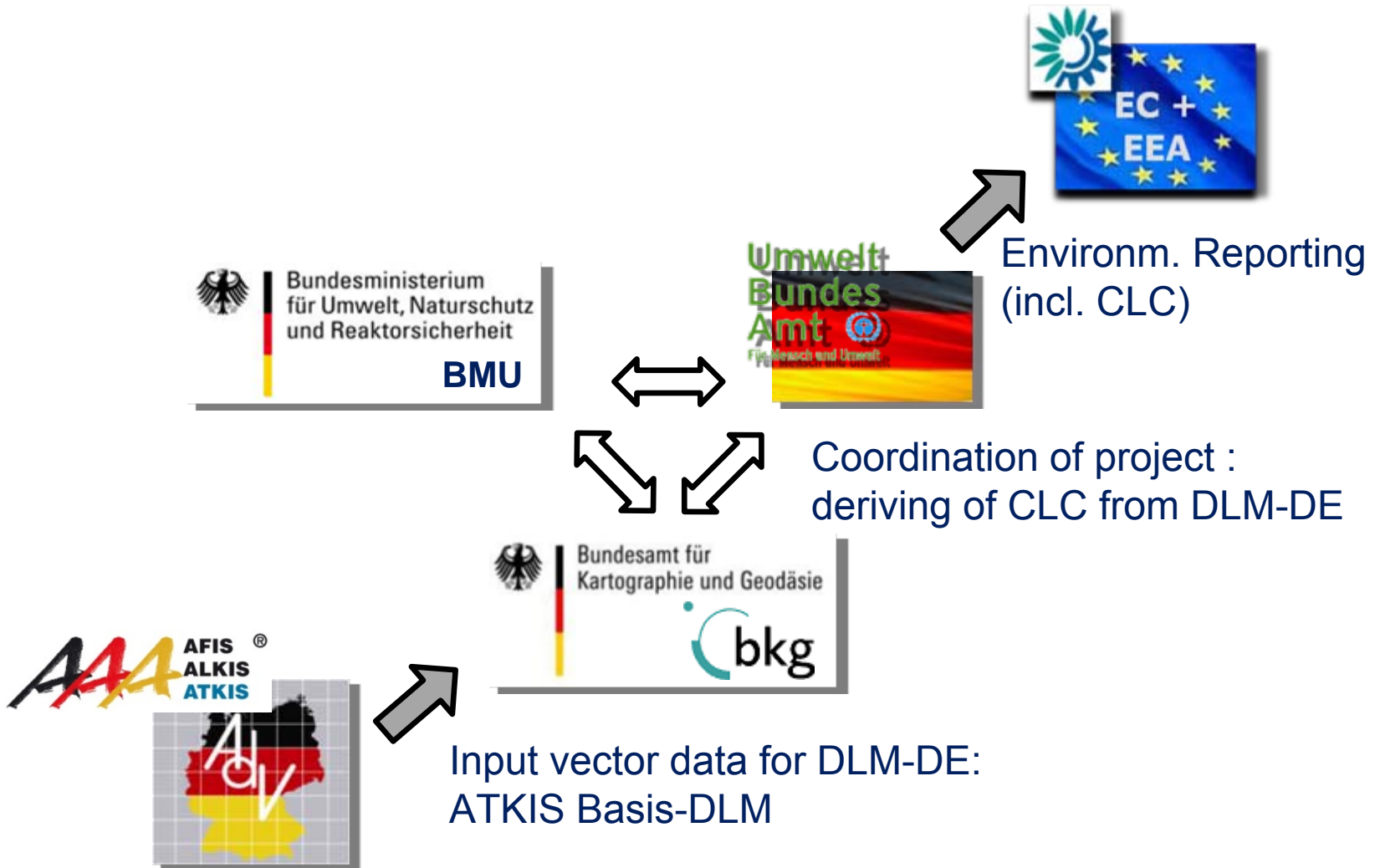
## General statements

- nationwide users require **higher** spatial and temporal **resolution** on land cover data than conventional CORINE Land Cover data can offer (MMU = 25 ha)
- **interoperability** between topographic reference data and thematic geoinformation data
- **save costs** through avoiding production of redundant data
- use of already **existing data**



## Aim of DLM-DE

- Capture of **LC/LU information** with high resolution (MMU 1 ha) to fulfill **requirements** of federal authoritative body, e.g. in the area of environmental monitoring, transportation, agriculture/forestry, protection of nature, water quality, spatial planning etc.
- **In line production** of DLM-DE with **EEA** activities
- **Deriving** LC/LU data from DLM-DE according to EU nomenclature of **CORINE** Land Cover
- **Integrate** CLC-relevant attributes in feature type catalogue of national/regional **surveying activities**

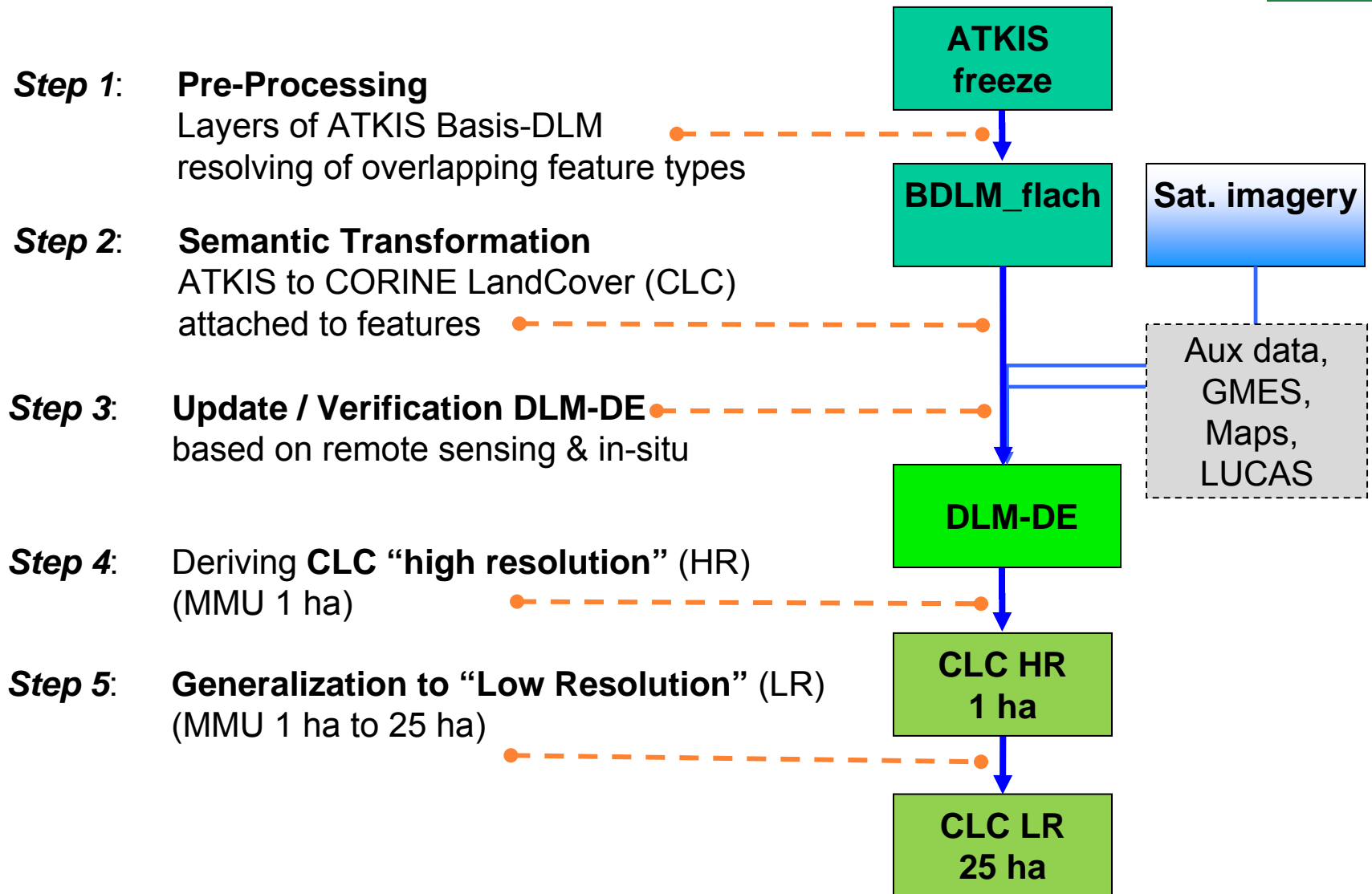




- **Input data** for DLM-DE2009 was authoritative topographic reference data (ATKIS Basis-DLM, scale 1:25.000), freeze for reference year 2009 (April)
- **Minimum Mapping Unit (MMU)** = 1 ha
- Main **source of update information** are multi-temporal **satellite imagery** of sensors RapidEye (5m) und DMC (32m) from 2009 (+2010)
- Update only for CLC-relevant selected **polygon feature types**



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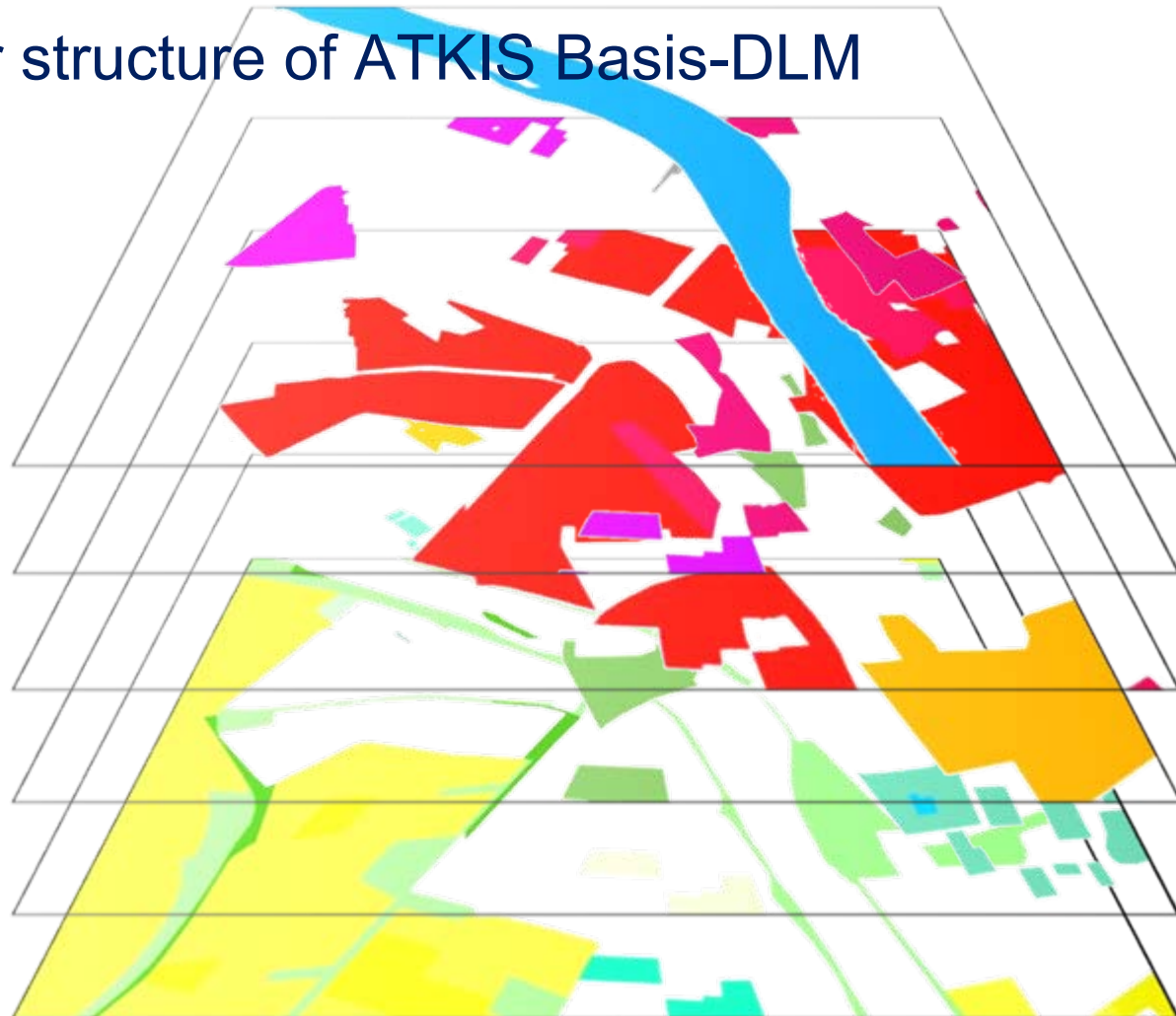




# Pre-processing: resolving layer structured overlay

## Original layer structure of ATKIS Basis-DLM

- Water Bodies
- Industry +  
Commerce  
Transportation
- Built-up area  
Housing
- Built-up area  
Ground layers
- Built-up area  
Special function
- Vegetation



# Pre-processing: resolving layer structured overlay

## Overlay-Information-Layer

Field	Value
OBJECTID	26339
Shape	Polygon
xyobj	2202+2224+2345
Anzahl	3
land	bw
Layer	sie02_f+sie06_f+sie04_f
Shape_Length	205,478704
Shape_Area	2303,4267

## BDLM\_flach



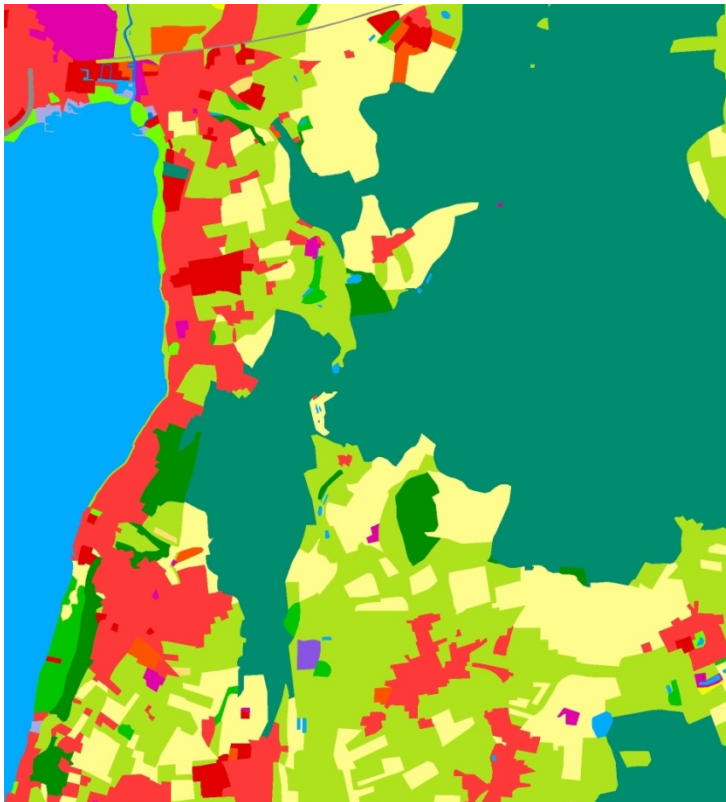


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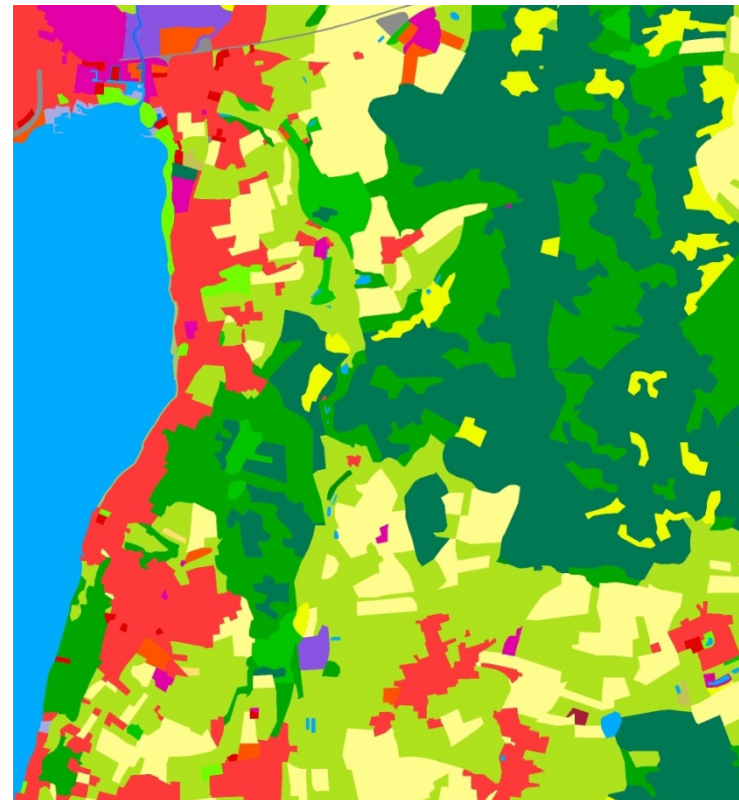


# Implementation: before (le.) and after (ri.) update

Increasing accuracy of thematic content in DLM-DE2009 referring vegetation (here forest areas and grassland vs cropland) before (le.) and after (ri.) update

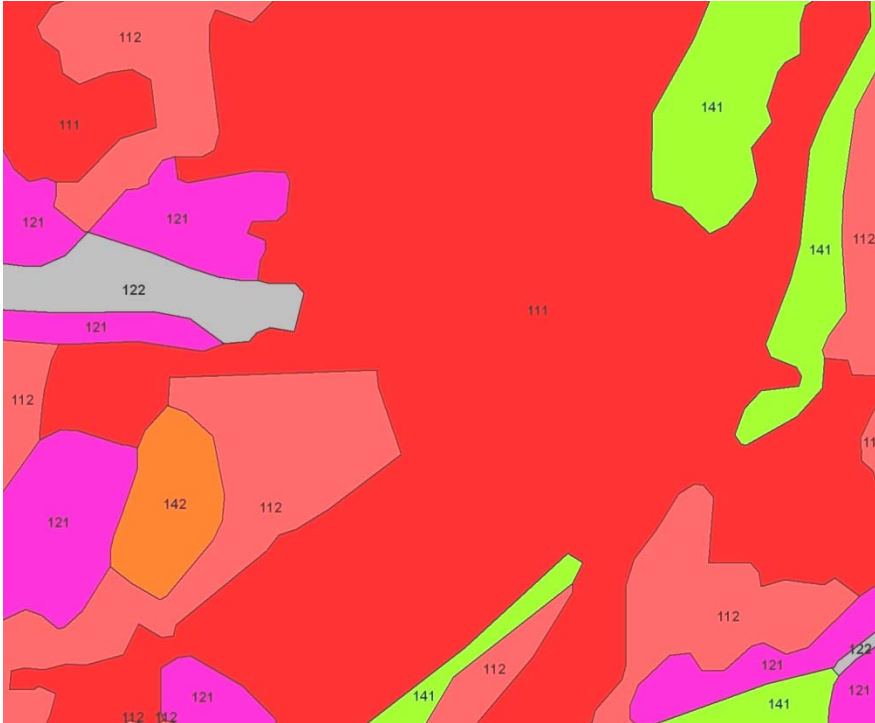


**BDLM\_flach (CLC-Legend)**

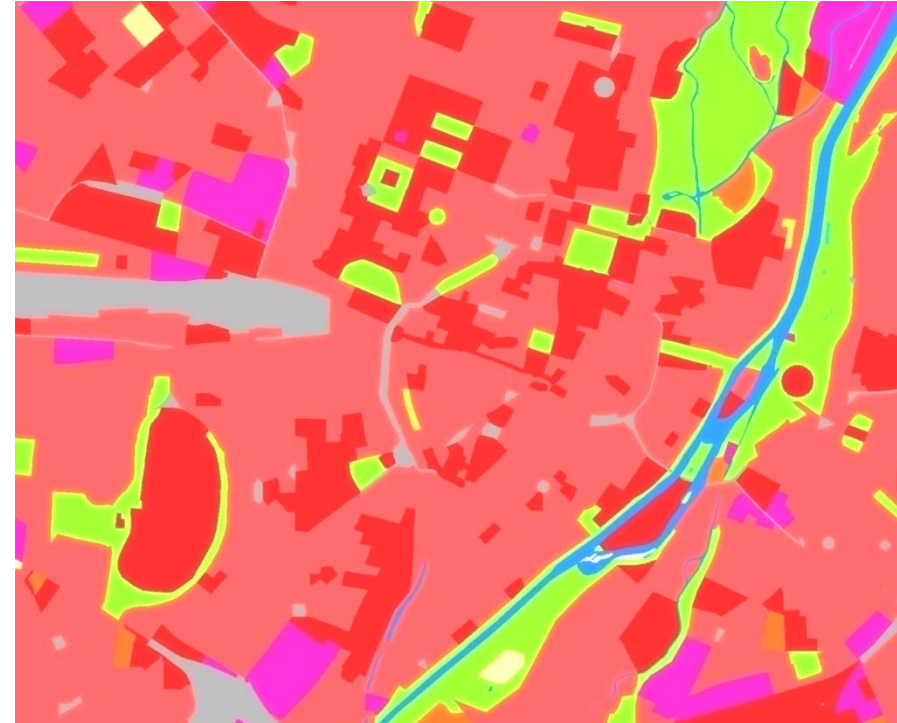


**DLM-DE2009**

## München, City center



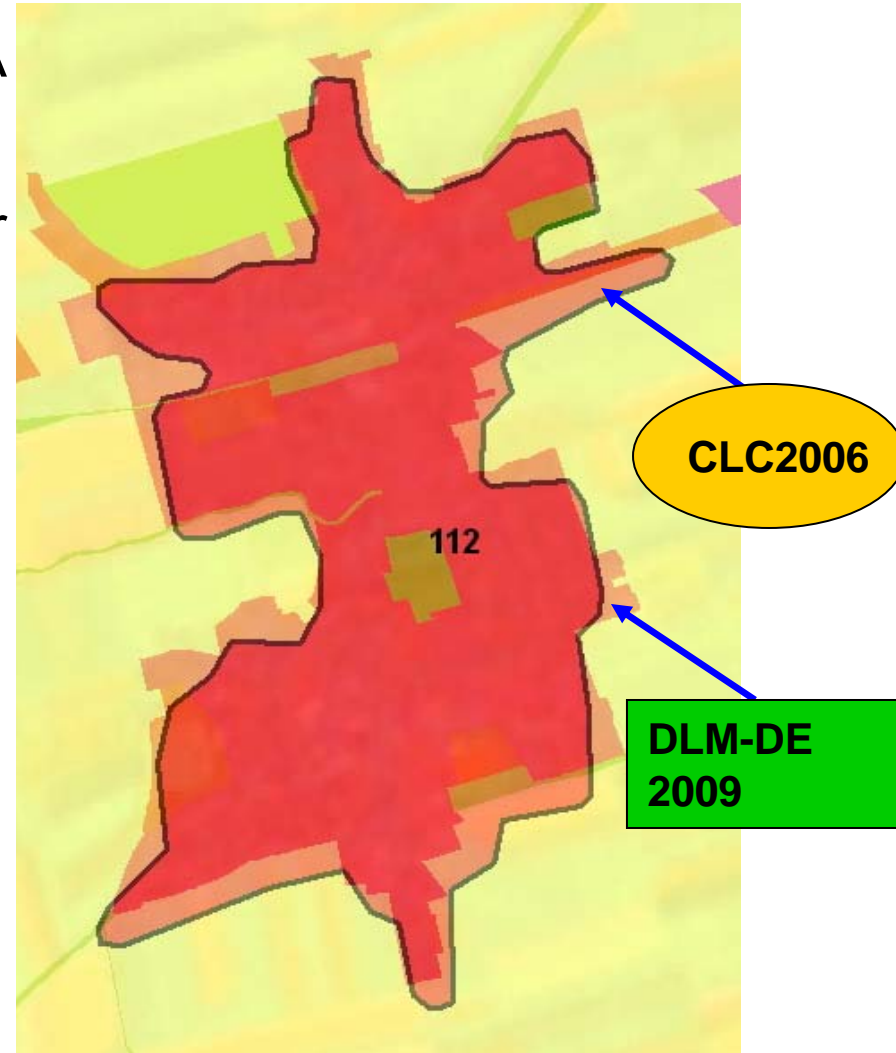
**CLC2000**  
MMU = 25 ha



**DLM-DE2009**  
MMU = 1 ha

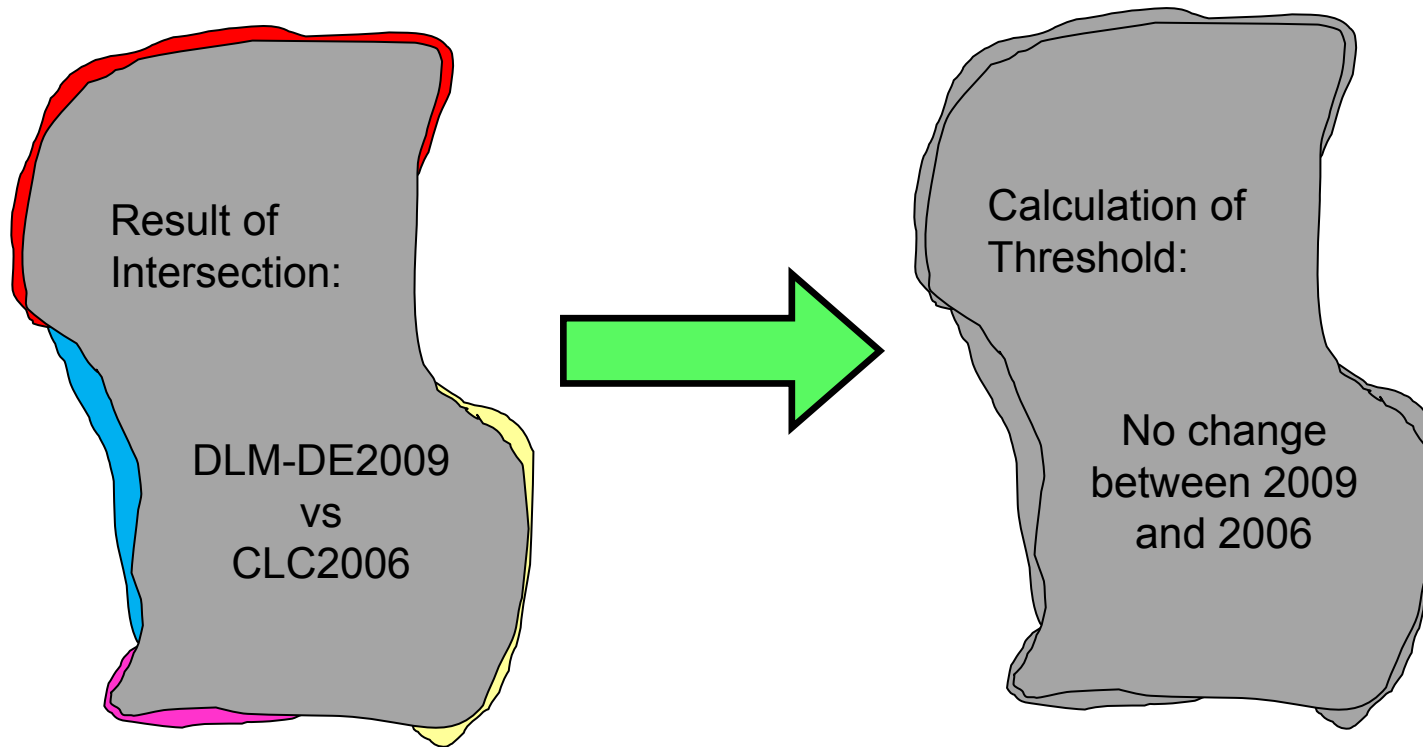
## Action Items: Detection of Pseudo Changes

- **Transition** from conventional EEA **method** to derivation of CLC data from DLM-DE results in land cover “**pseudo changes**”.
- Comparison of both results of conventional CLC and DLM-DE in helps to **quantify divergence** of geometry outlines.



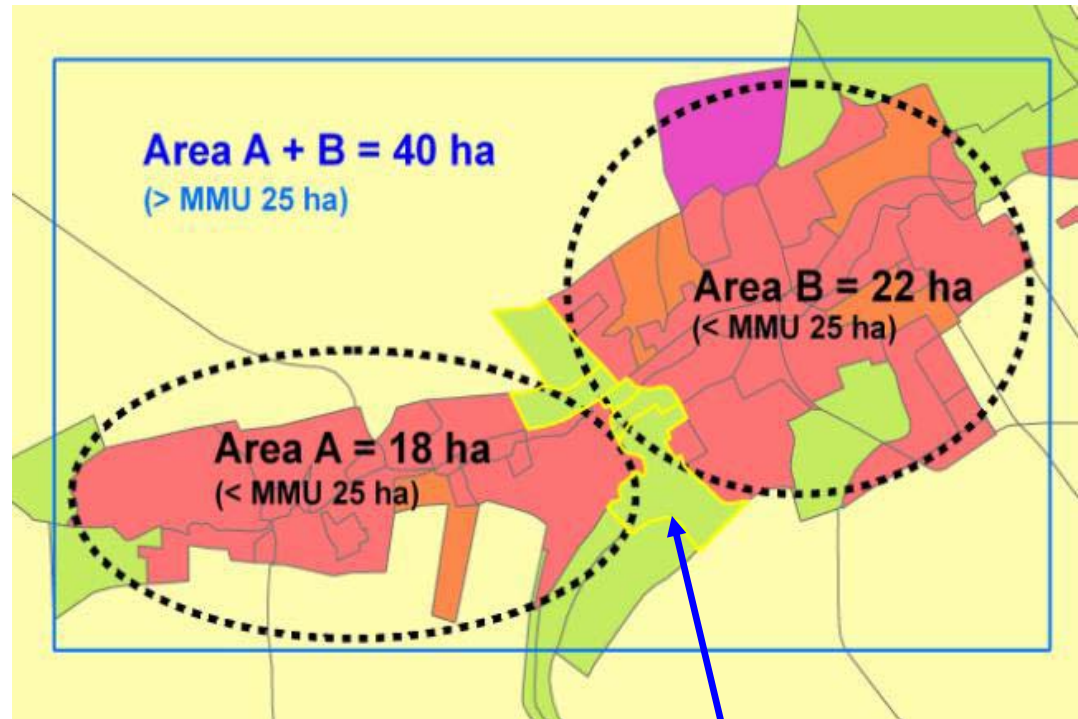
## Action Items: Detection of Pseudo Changes

- Application of probable **thresholds** (connection between geometric and thematic changes) will identify pseudo changes



## Avoid effect of **Separators**:

During unsupervised generalization “Separators” can occur. Land Cover features which spatially belong together (area A+B) are separated by polygons (grassland) in between and would disappear even though MMU (25 ha) in whole is reached.

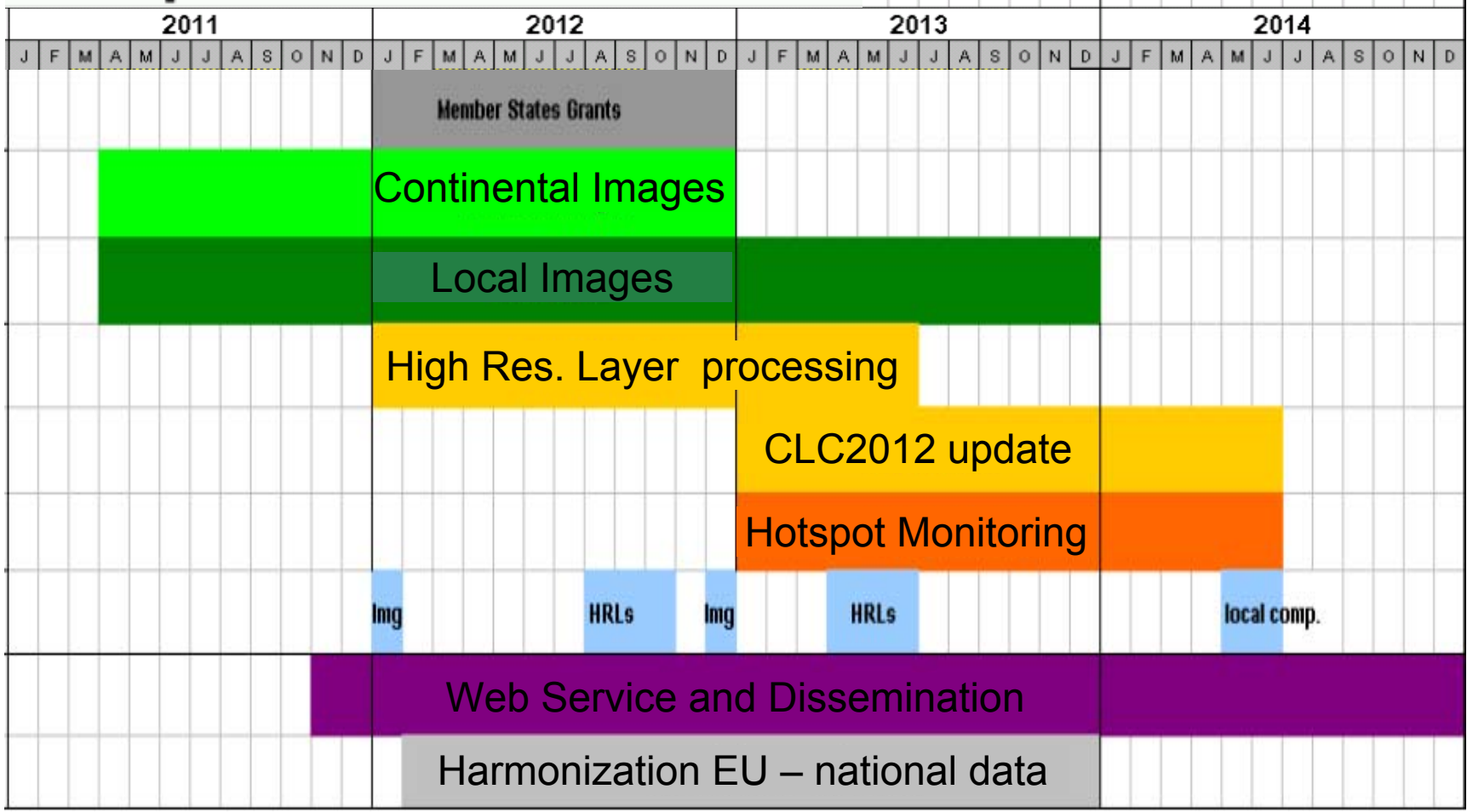




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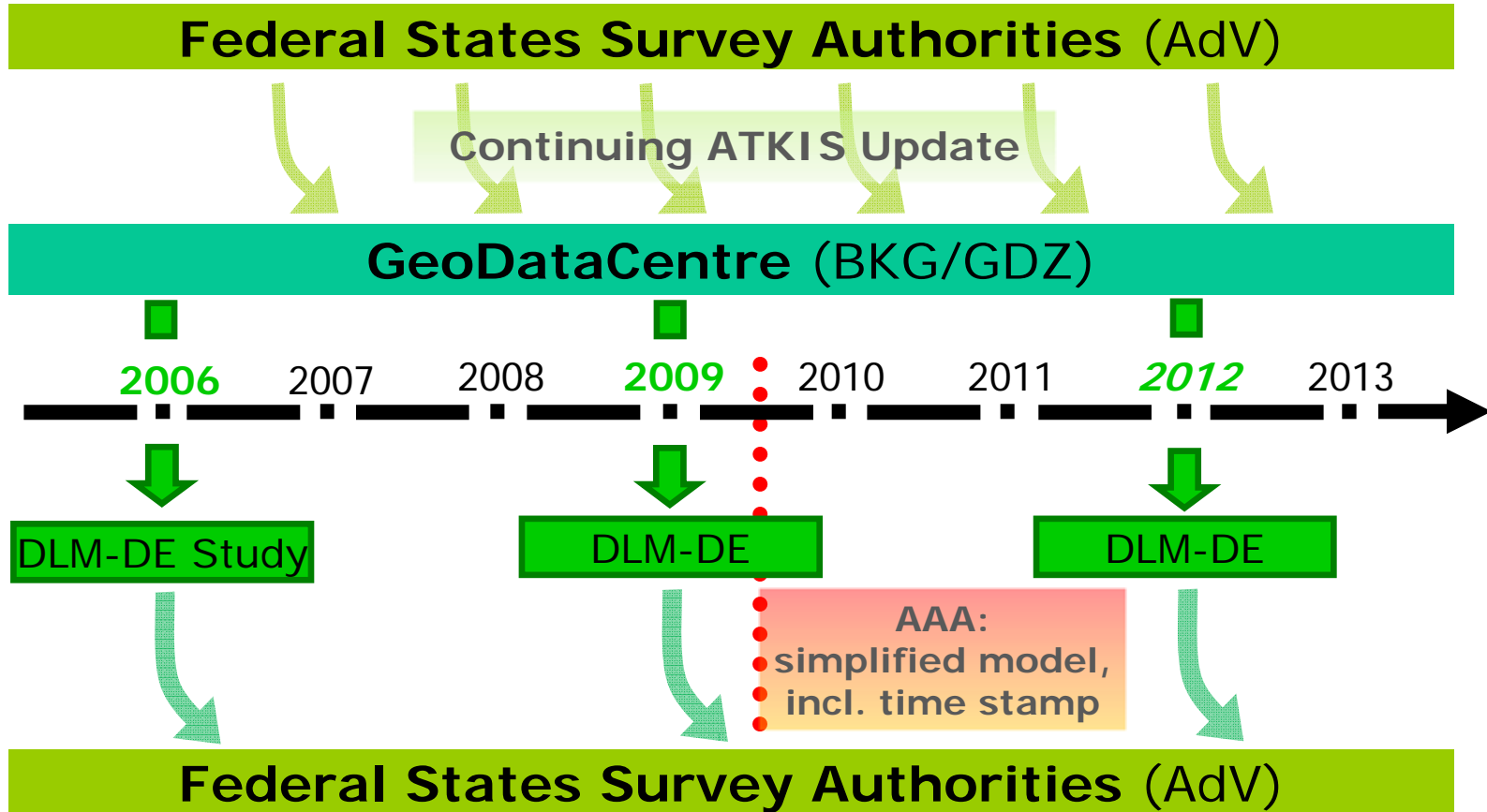
## Workplan GIO Land Services



Extract from GMES Initial Operations (GIO) timetable



# Perspectives and Planning: Data flow, new data model



Time stamp for every feature within AAA-model:  
⇒ future cost saving, update only necessary for features older than reference year

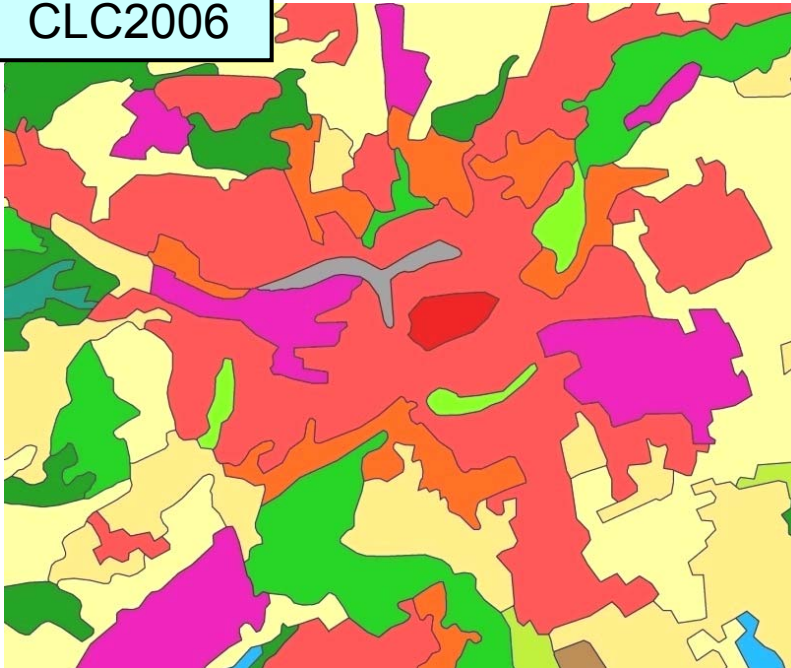


## Advantages and Synergies of bottom-up approach:

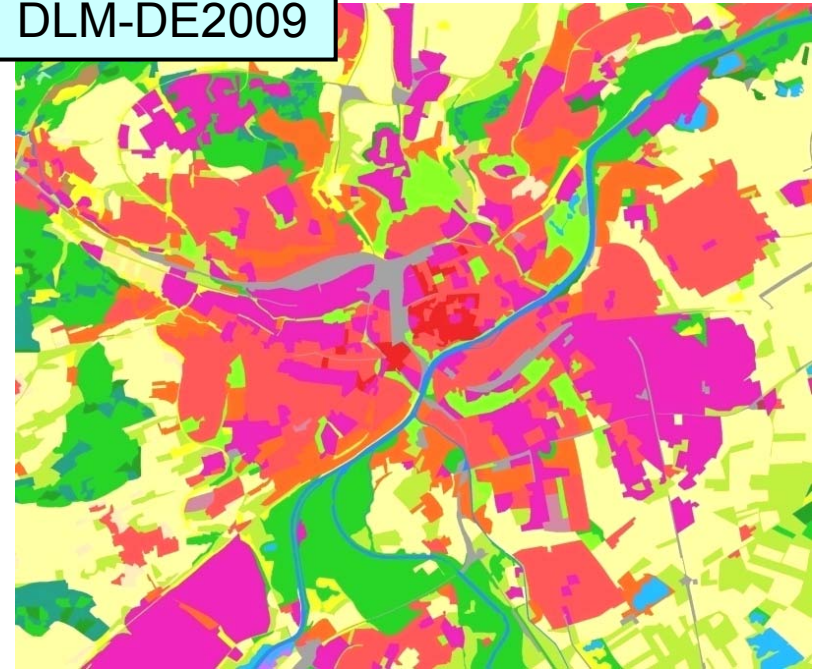
- **Data backflow** of DLM-DE results **to federal states** surveying authorities for purpose of Integration in ATKIS.
- **Higher level of detail (LoD)** of thematic spatial data will cover national and European user requirements
- **Interoperability** and **harmonization** between topographic reference data and thematic spatial data (national and European point of view => INSPIRE)
- **Integration** of **GMES data** (Space component and Land Core Service) in national approach hopefully will lead to increase of data quality and decrease of cost



CLC2006



DLM-DE2009



## Thank You!

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