

Status of European Geospatial Infrastructures

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Outline

- 1 Introduction**
- 2 GMES**
- 3 INSPIRE**
- 4 Integrated Development**
- 5 Conclusion**

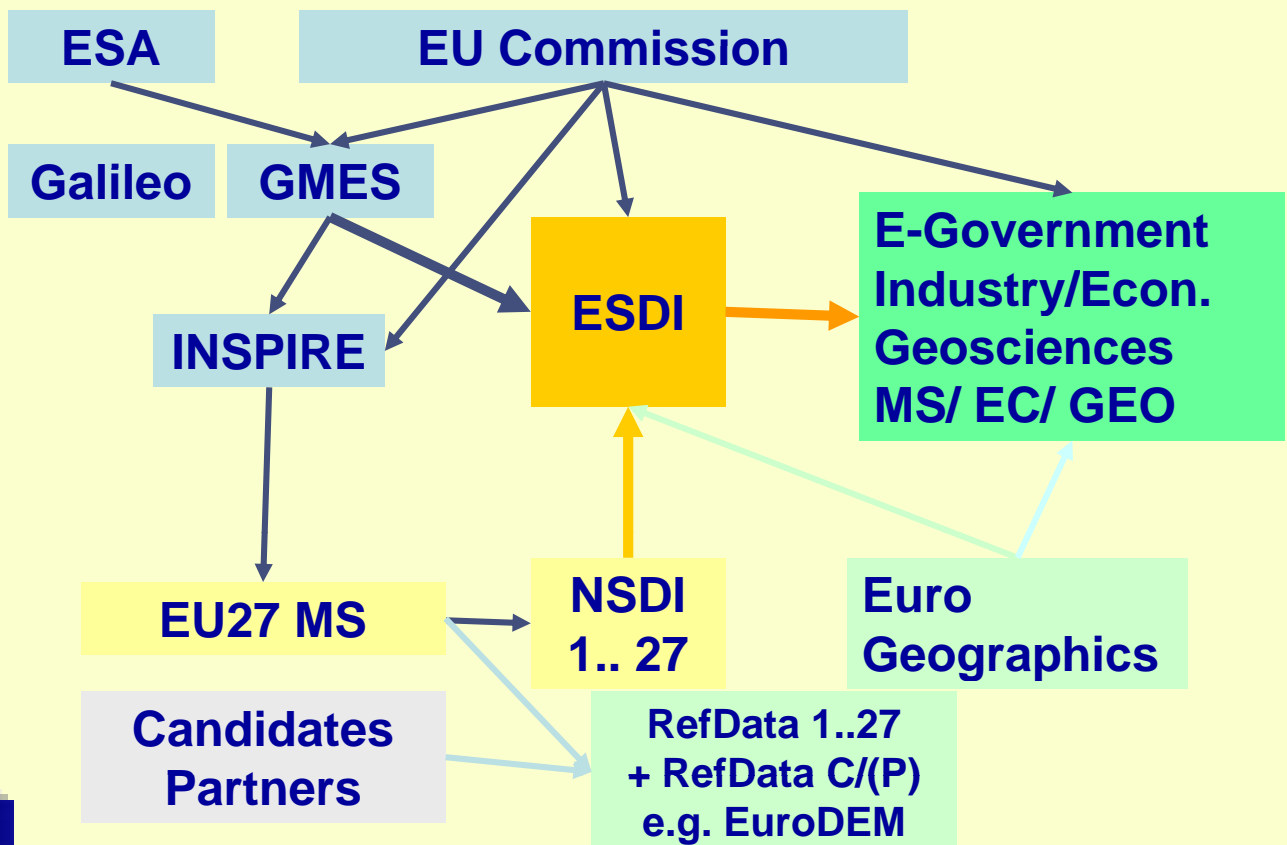


ESDI Requirements

Water Framework directive (2006-2015+)	
Community Biodiversity Strategy (2006 – 2010+) Habitats directive Natura2000, 2010 target	
Common Agriculture Policy (agri-environmental Regulation; New guidelines for Rural Development; CAP evaluations 2007-2013)	
Community Structural Policies (European Spatial Development Perspective –Territorial Cohesion; 2007-13)	
Follow up European Strategy for ICZM (2006+)	
European Thematic Strategy on Urban Environment and sustainable land use (2006+)	
European Thematic Strategy on Soil Protection (2006+)	



European Spatial Data Infrastructure (ESDI)



GDI Framework

GDI := {Networks, GDB, GeoPortal (services), Standards}

Networks

- organisational
- technical (IT)

Geo Data Base

GDB = {reference data, thematic data metadata}

GeoPortal

Central Point of Entry to Services



Reference System & Map Projections (EU)

ETRS89	Ellipsoidal CRS	<ul style="list-style-type: none"> • for storing positions in general ellipsoidal latitude, longitude and height • based on ellipsoid GRS80
ETRS-TMzn	ETRS Transverse Mercator CRS	<ul style="list-style-type: none"> • for topographic maps with scales smaller or equal 1 : 500 000 • similar UTM for northern hemisphere
ETRS-LCC	ETRS Lambert Conformal Conic CRS	<ul style="list-style-type: none"> • for topographic maps with scales larger than 1 : 500 000 • Lambert projection with 2 parallels
ETRS-LAEA	ETRS89 Lambert Azimuthal Equal Area CRS	<ul style="list-style-type: none"> • for statistical purposes and all applications with equal area projections



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GMES Mission

Resolution of the European Council (2001) :

**„To develop an independent,
sustainable and reliable European
Earth observation capacity
operational by the end of 2007“**



Global
Monitoring for
Environment and
Security

since 2003:

GMES → Europe's contribution to
GEOSS



Political & Strategic Agenda

GMES will:

- realise an “**information chain**” from observations to inventories whose outputs users can assimilate to their models,
- be part of the European Spatial Data Infrastructure (ESDI) complementing INSPIRE,
- support the development of new capacity where needed,
- strengthen the **competitiveness of EU service providers** of geographic content on the world market
- be the European contribution to the **Global Earth Observing System**



GMES Space Component (ESA)

- **Sentinel - 1:** high-resolution synthetic aperture radar (SAR) imaging (by 2011)
- **Sentinel - 2:** high-resolution multi-spectral imaging (by 2011)
- **Sentinel - 3:** global ocean and land monitoring (later than 2011)
- **Sentinel - 4:** geostationary atmospheric monitoring (later than 2011)
- **Sentinel - 5:** low-orbit atmospheric monitoring (later than 2011)



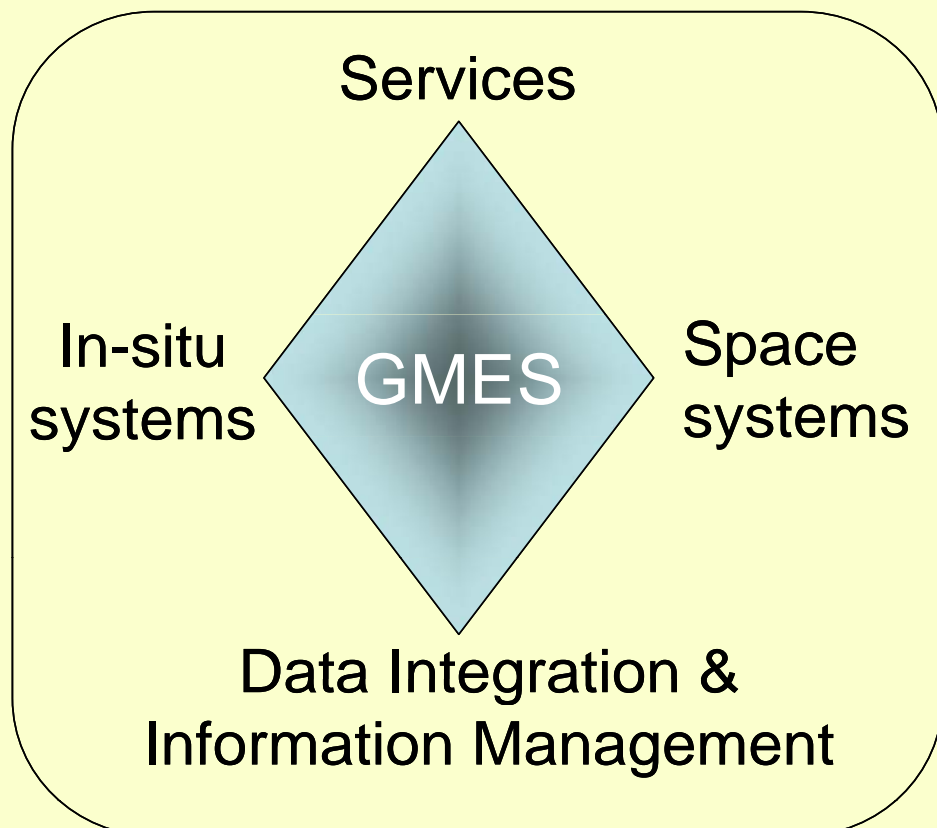
GMES Services

- Marine Environment
- Emergency Response
- Land Monitoring

- Atmosphere
- Security



Concept of GMES Land Monitoring



Land Monitoring Core Service (LMCS)

COMPONENTS OF LMCS	ELEMENTS	YEAR OF LAUNCH
Continental (all Europe27+)	<ul style="list-style-type: none"> •Ortho-rectified imagery •Image mosaics •Land-cover (CORINE type) •Land-cover (High resolution: 1 ha) 	2008 = GMES "Fast-Track" continued development until annual (seasonal) update
Local (Limited areas in EU-wide uniform standard)	<ul style="list-style-type: none"> •Ortho-rectified imagery •Very high resolution (0.25ha) land-use/land-cover information for 300 – 500 urban agglomerations above 100000 inh. participating in the Urban Audit 	2009 = GMES "Fast-Track" Development towards later inclusion of other "hot spots" (transport, construction, mining, agricultural or forest activities, biotopes, sites of high sensitivity or rapid change)
Global	Possibly world crop monitoring, carbon stocks on land surfaces, environmental parameters	2010 (?) t.b.d. by an ad-hoc-WG to be established 2007



Requirements for GMES LMCS

Coverage	MMU	Up-date cycle
European Continent	1 ha (1:25-50,000)	every year, 2 seasons
Cities ≥ 100,000 in. ≥ 1 Mio in.	0.1 ha (1:5,000)	every 3 years yearly
“hot spots” of interest in agriculture, transport, tourism, mining, construction, etc	0.25 ha (1:10,000)	~ 3 times per year



GMES Land Monitoring Service

Earth Observation

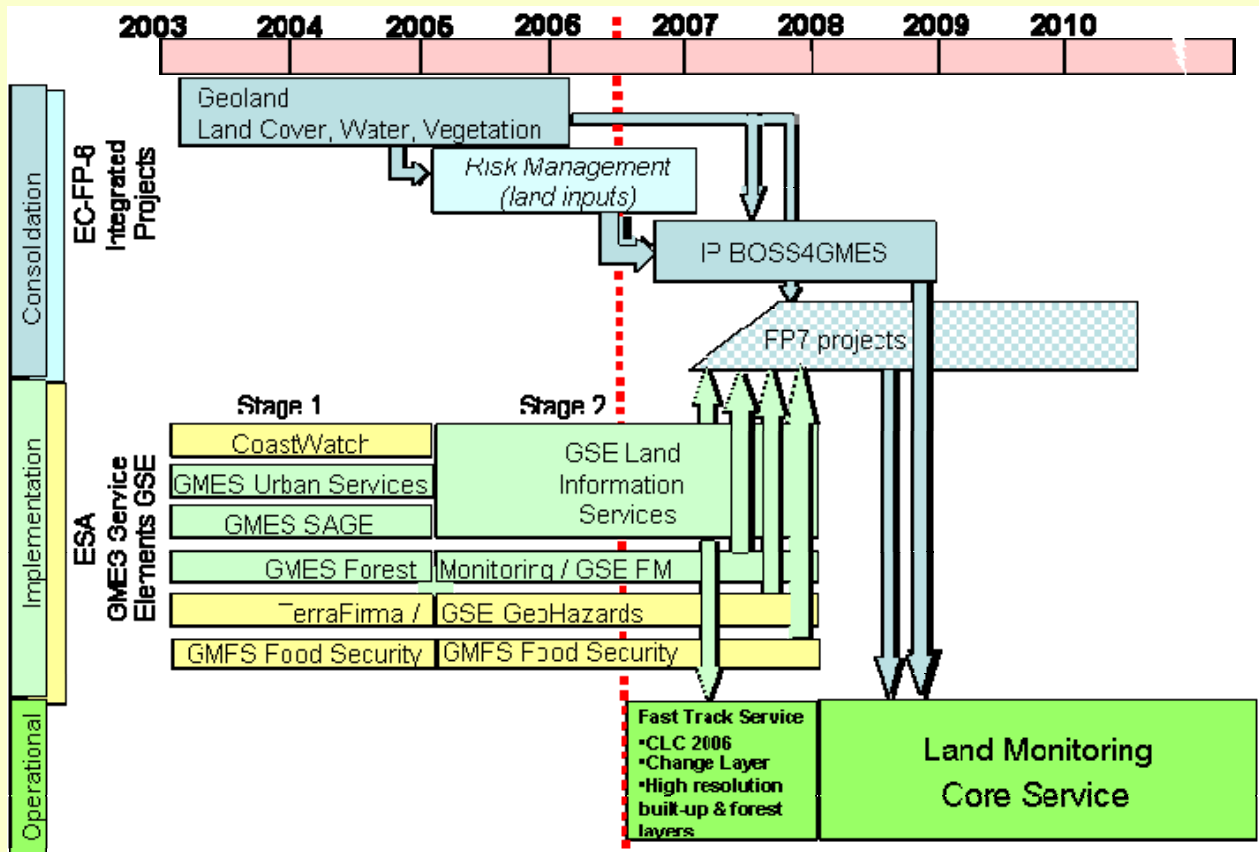
In situ monitoring

Core land cover data service

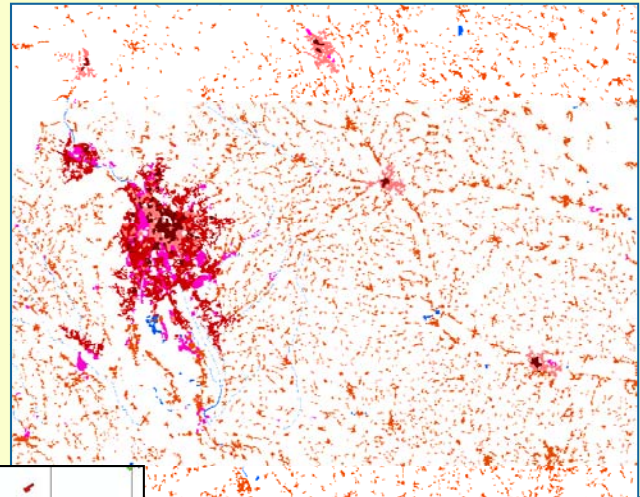
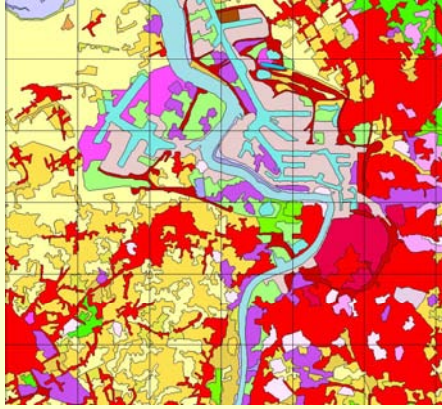
Downstream services



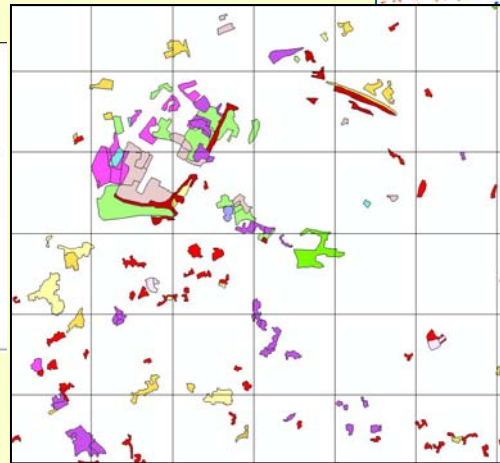
GMES Preparatory Projects



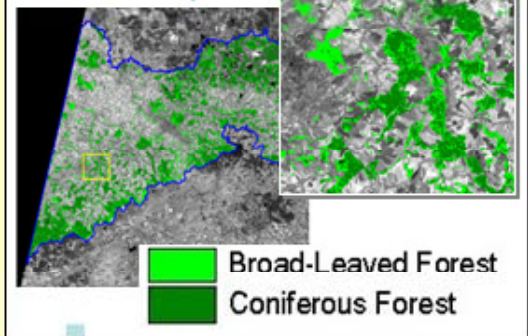
Land Monitoring FTS



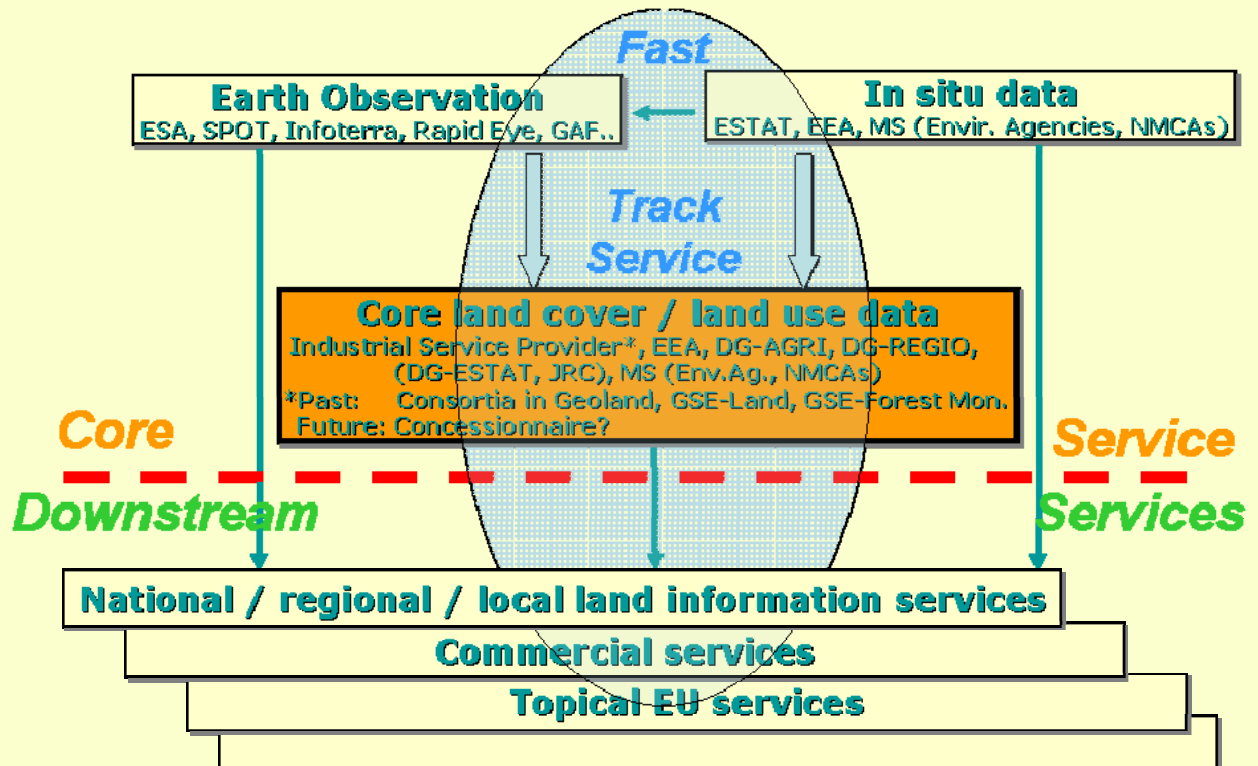
Land cover classes	
Continuous urban fabric	Agro-forestry areas
Discontinuous urban fabric	Broad-leaved forest
Industrial or commercial units	Coniferous forest
Road and rail networks and associated land	Mixed forest
Port areas	Natural grasslands
Alperts	Meads and heathland
Mining extraction sites	Sclerophyllous vegetation
Dumps sites	Traditional woodlands
Construction sites	Beaches, dunes, sands
Green urban areas	Bare rocks
Sport and leisure facilities	Taroch vegetated areas
Non-irrigated arable land	Burnt areas
Permanently irrigated land	Glaciers and perpetual snow
Rice fields	Island meadows
Vineyards	Peat bogs
Fruit trees and berry plantations	Salt marshes
Olive groves	Salines
Pastures	Intertidal flats
Annual crops associated with permanent crops	Water courses
Complex cultivation patterns	Water bodies
Land principally occupied by agriculture, with significant areas of natural vegetation	Coastal lagoons
	Estuaries
	Sea and ocean
	NODATA



Forest maps



FTS: Land Monitoring





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INSPIRE Directive



INSPIRE Process

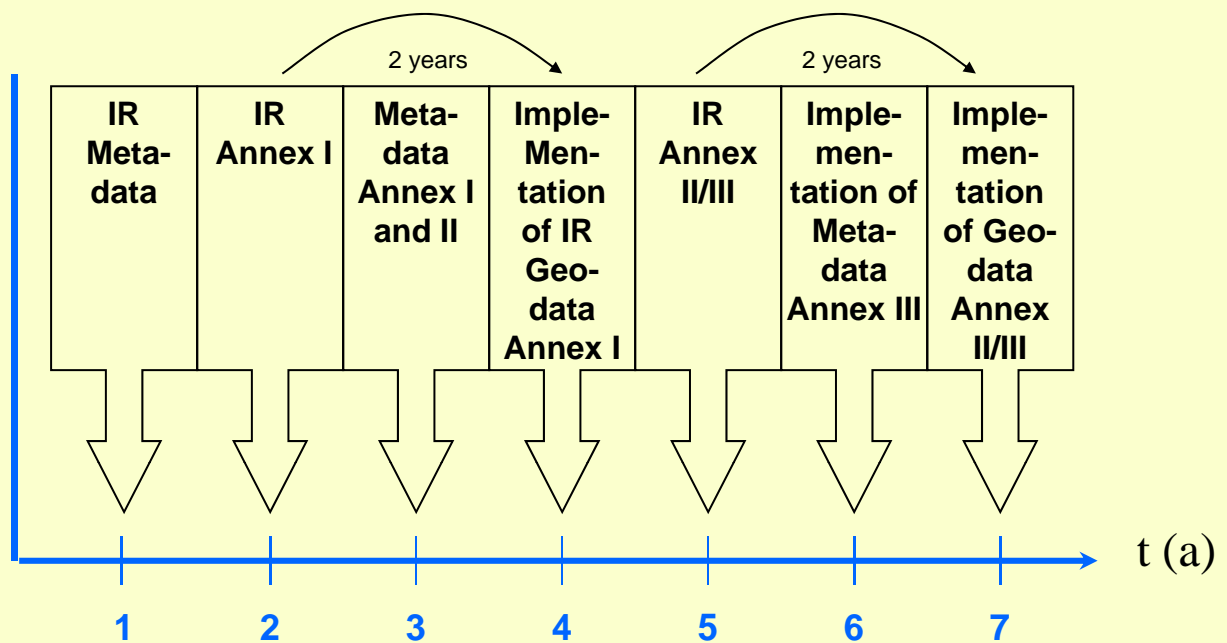
- **Start: 2001**
- **INSPIRE Expert Group 2001-2007**
- **Draft Directive: Summer '04**
- **Directive in force: 15.05.2007 (Annex I-III)**
- **Regularity Committee: June 2007**
- **Implementation Rules: according to schedule**
- **National Law: 15.05.2009 (Germany: WG GDI-G)**

INSPIRE Principles

- GDI data shall be acquired and maintained only **once**
- Geodata must be utilized for **other resolution levels**
- Geodata from different sources have to be **interoperable**
- Geoinformation must be visualized such that it can **easily be understood and interpreted.**
- **Registries/catalogue services** have to efficiently support the search processes (availability, quality, conditions of usage)
- **Acceptable rules** shall be established which are no hindrance to the use of geodata (rights of access, use and protection).



INSPIRE Schedule



**15 May
07 Dir.
in force**

IR:= Implementation Rules



Annex I: Reference information

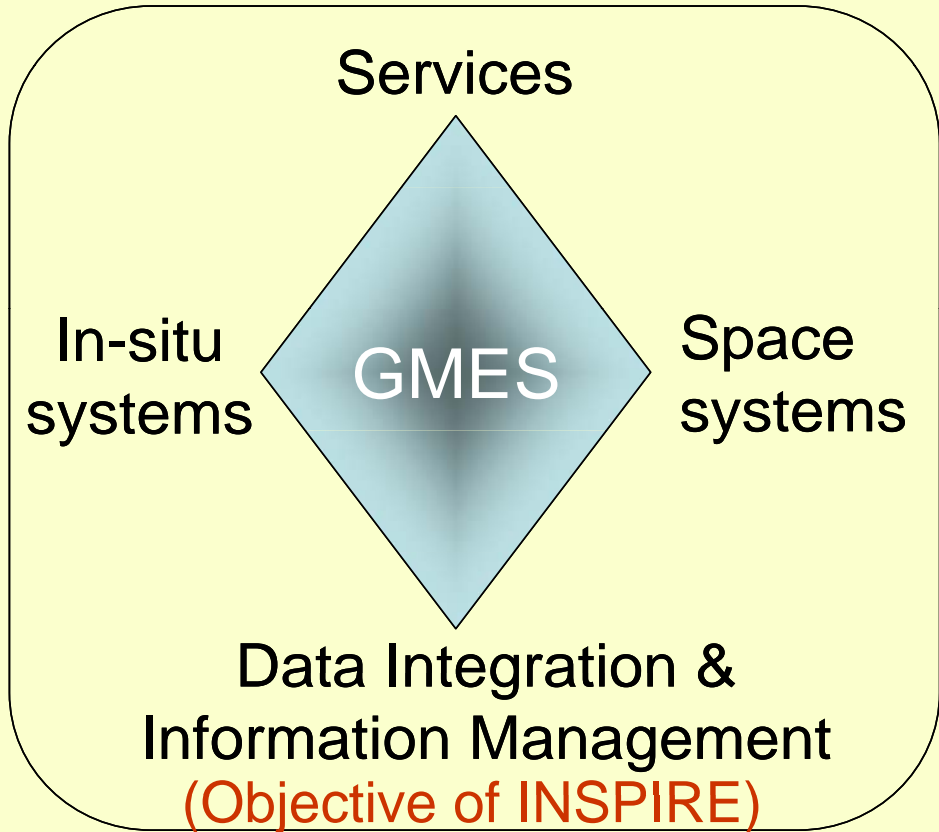
Administrative units		EuroBoundaryMap	EuroBoundaries
Transport	ERM & EGM	EuroRoadS	
Hydrography		RISE	
Elevation			EuroDEM
Cadastral parcels		C&LR project	
Ortho-imagery			
Protected sites			
Land cover			
Referencing and coordinate systems			
Coordinate reference systems		CRS	CRS v2
Geographical grid systems			
Geographical Names		EuroGeoNames	

Outline

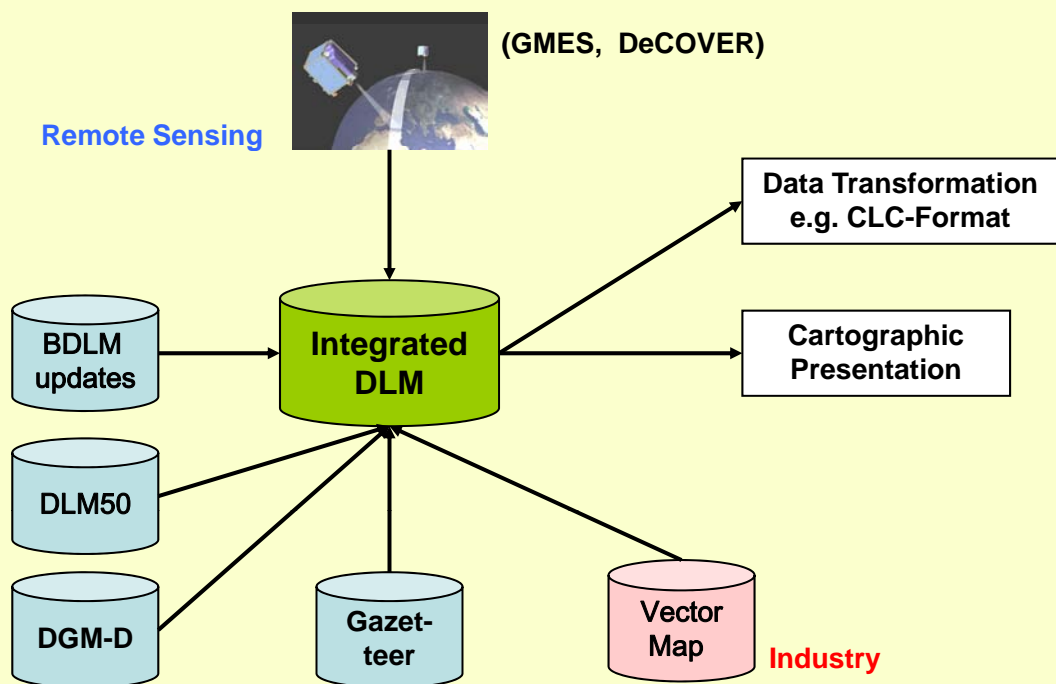
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Integrated ESDI



Integrated Reference Data



System Components (WipkA)

GIS Component

- 1) Automatic Pre-Processing
- 3) Interactive Post-Processing

Knowledge-Based Component

- 2) Automatic Updating

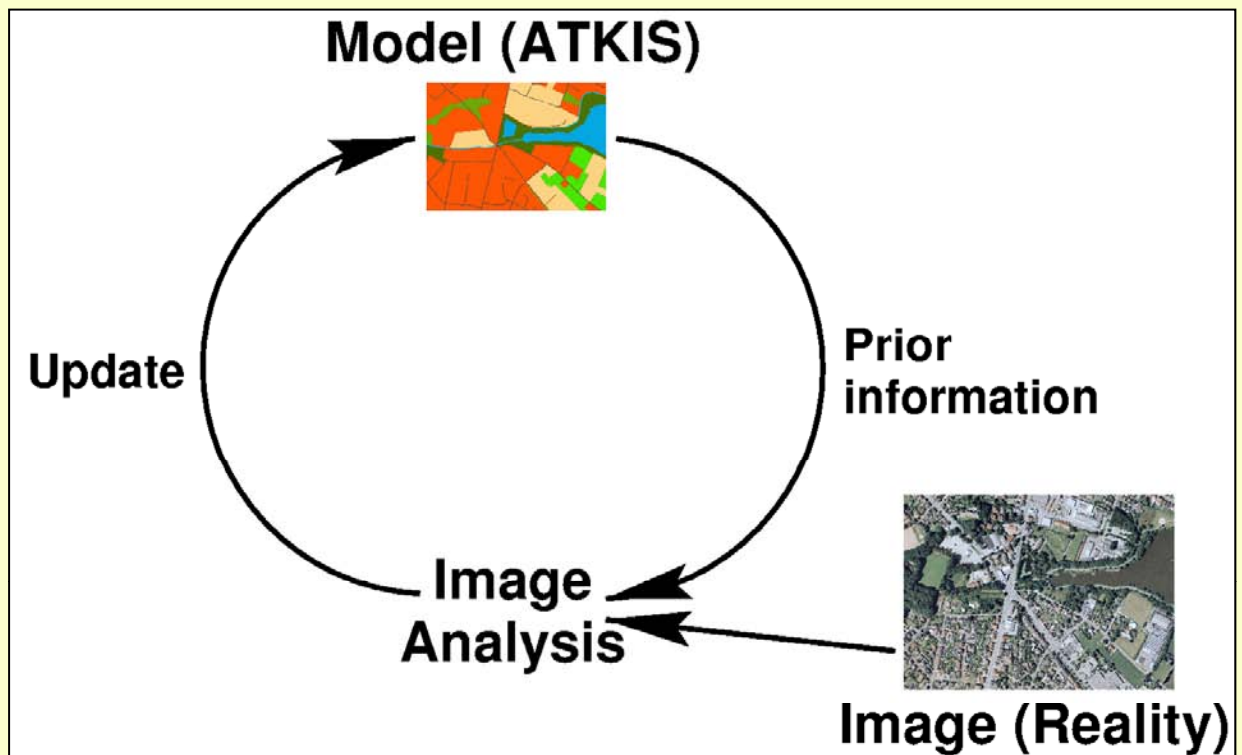
- Control of Algorithms
- Object Extraction
- Verification
- Update

Photogrammetric Component



R&D project WipkA of BKG and Leibniz University Hannover

Integrated Update Process



R&D project WipkA of BKG and Leibniz University Hannover

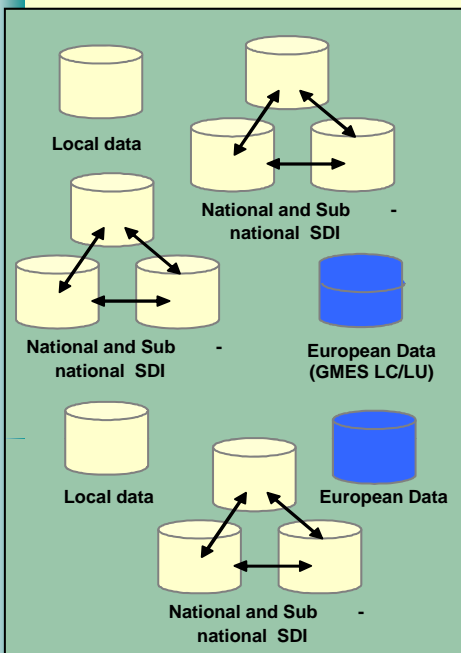
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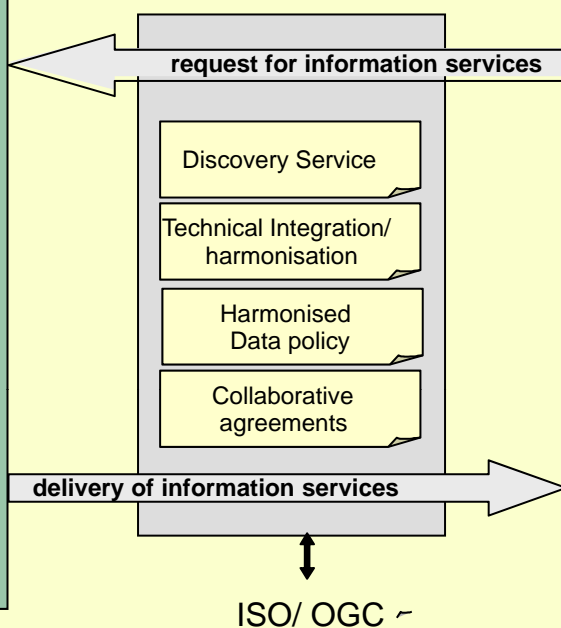


The Integrated ESDI

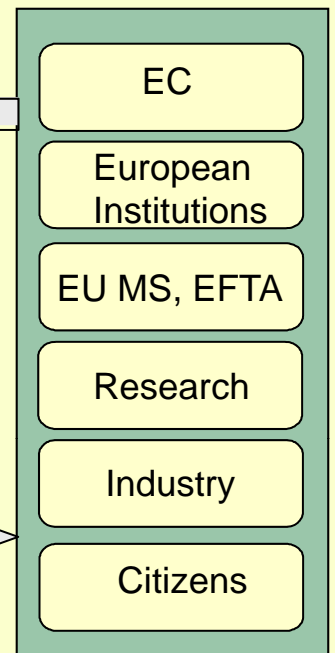
Data resources



ESDI specifications



Users





Status of ESDI

GMES

- Fast Track Services operational in 2008
- Preparatory projects (industry, e. g. geoland, GSE) successful, however data processing not state-of-the-art

INSPIRE

- Implementation underway (a lot of legal and technical work need still to be done)
- Implementation of NGDIs ahead ESDI

EuroGeographics

- Capable to deliver European harmonised products (EuroDEM etc.)
- Partner of EC



Thank you for your attention!

