



POSODOBITEV  
PROSTORSKE  
PODATKOVNE  
INFRASTRUKTURE  
ZA ZMANJŠANJE  
TVEGANJ IN  
POSLEDIC POPLAV



**Olaf Magnus Østensen**

**Statens kartverk**

**Norwegian Mapping Authority**

- **Presentation of the project from the perspective of the donor**  
**(How we can contribute)**

**OTVORITVENA KONFERENCA PROJEKTA**  
**(Project opening conference)**

Gospodarsko razstavišče Ljubljana, dvorana POVODNI MOŽ  
Ljubljana, 4. februar 2014

# The project



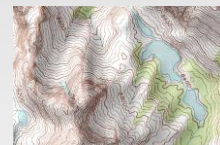
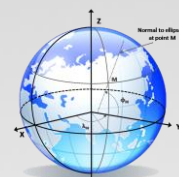
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## 'Modernization of spatial data infrastructure to reduce risks and impacts of floods'

With subprojects

- Geodetic Reference Frame (GRFR);
- Topography (TOPO);
- INSPIRE (INSP) and
- Hydrography (HIDRO).



# Standards

## an important competence

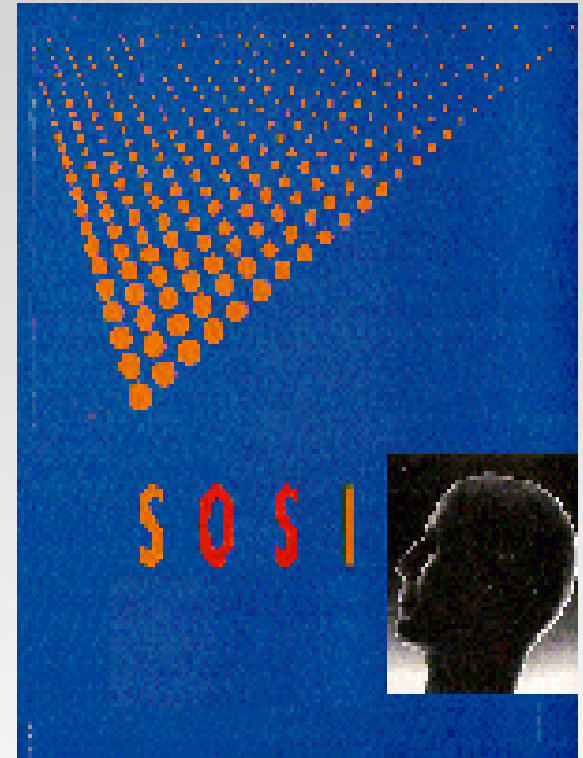


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SOSI – The national standard  
for data description and exchange

- Introduced in 1986
- Made it possible to exchange data between different systems
- Defines around 40 different themes – reference and thematic
- Has been developed and extended simultaneously with upcoming demands and general development
- Ensures a common reference for an adaptation to international standards



# Kartverket participates in ...



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International  
Organization for  
Standardization

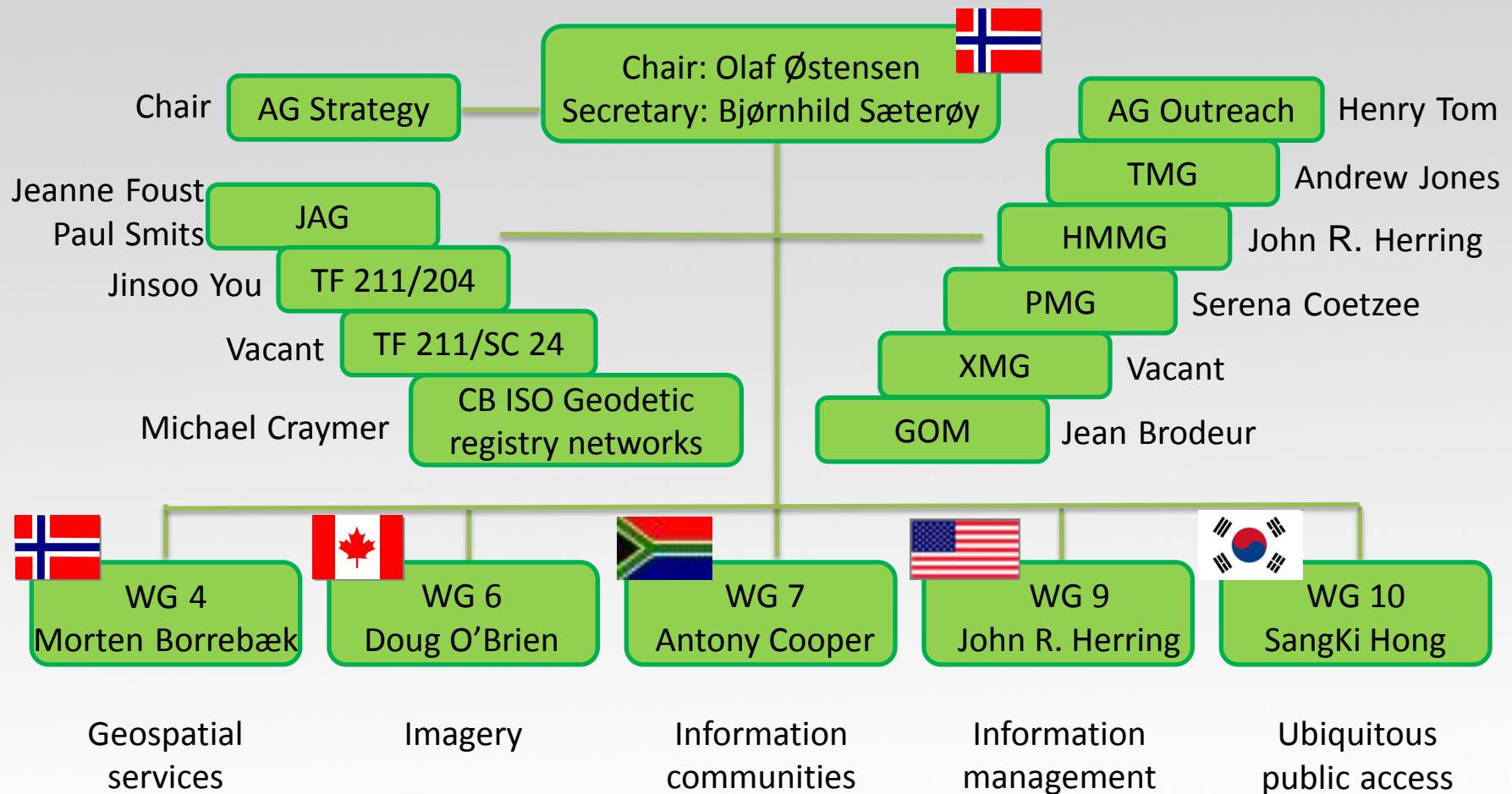




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# ISO/TC 211 organization





# The geodetic reference frame



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# National reference framework







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# Monitor our planet





# Monitoring post-glacial rebound and land rise



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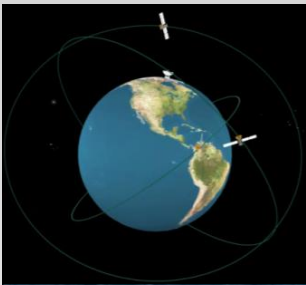




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# Monitoring sea levels







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# Accurate positioning



*... the goal – 1 cm precision in real time*

# Kartverket in lead for a UN resolution on geodesy



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# Topographic base map



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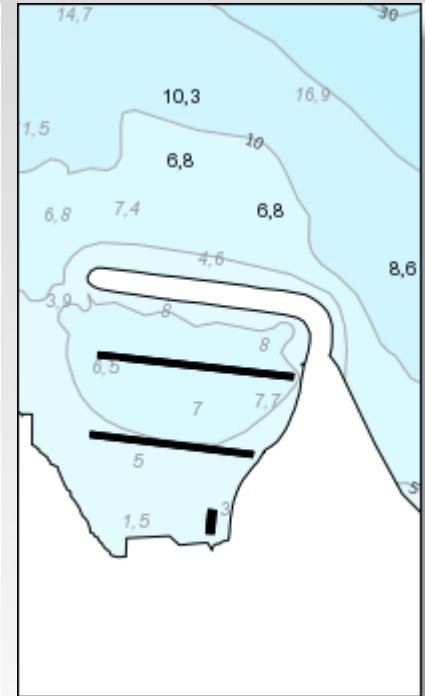
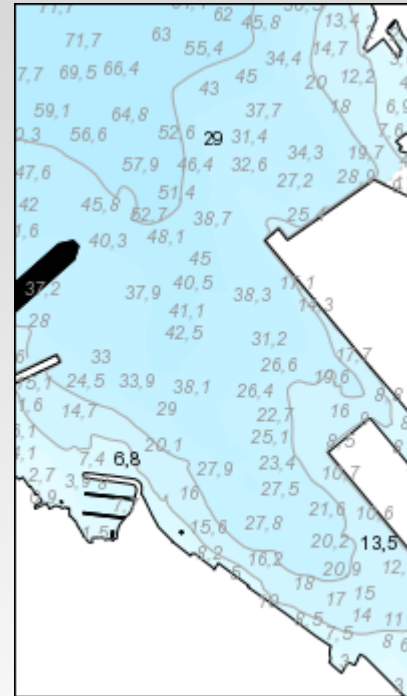
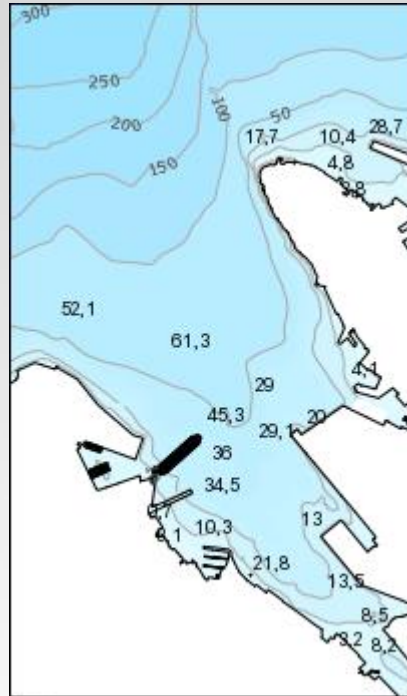
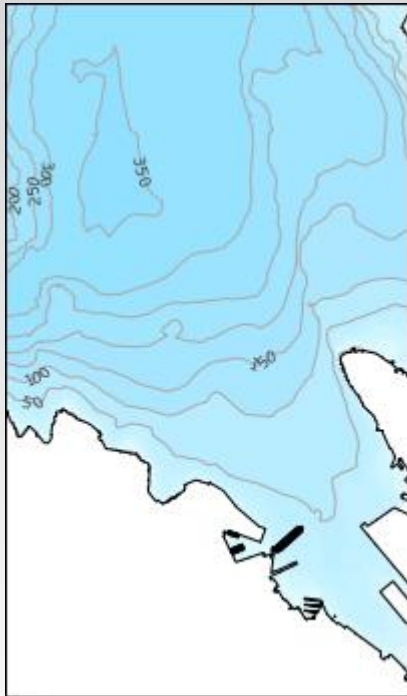




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# Bathymetric data

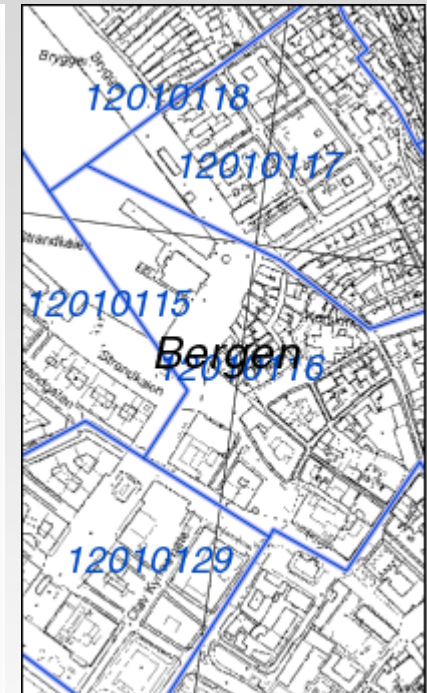
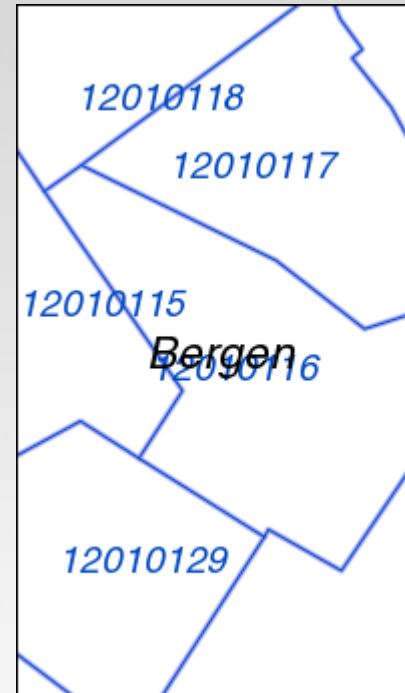




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# Administrative boundaries



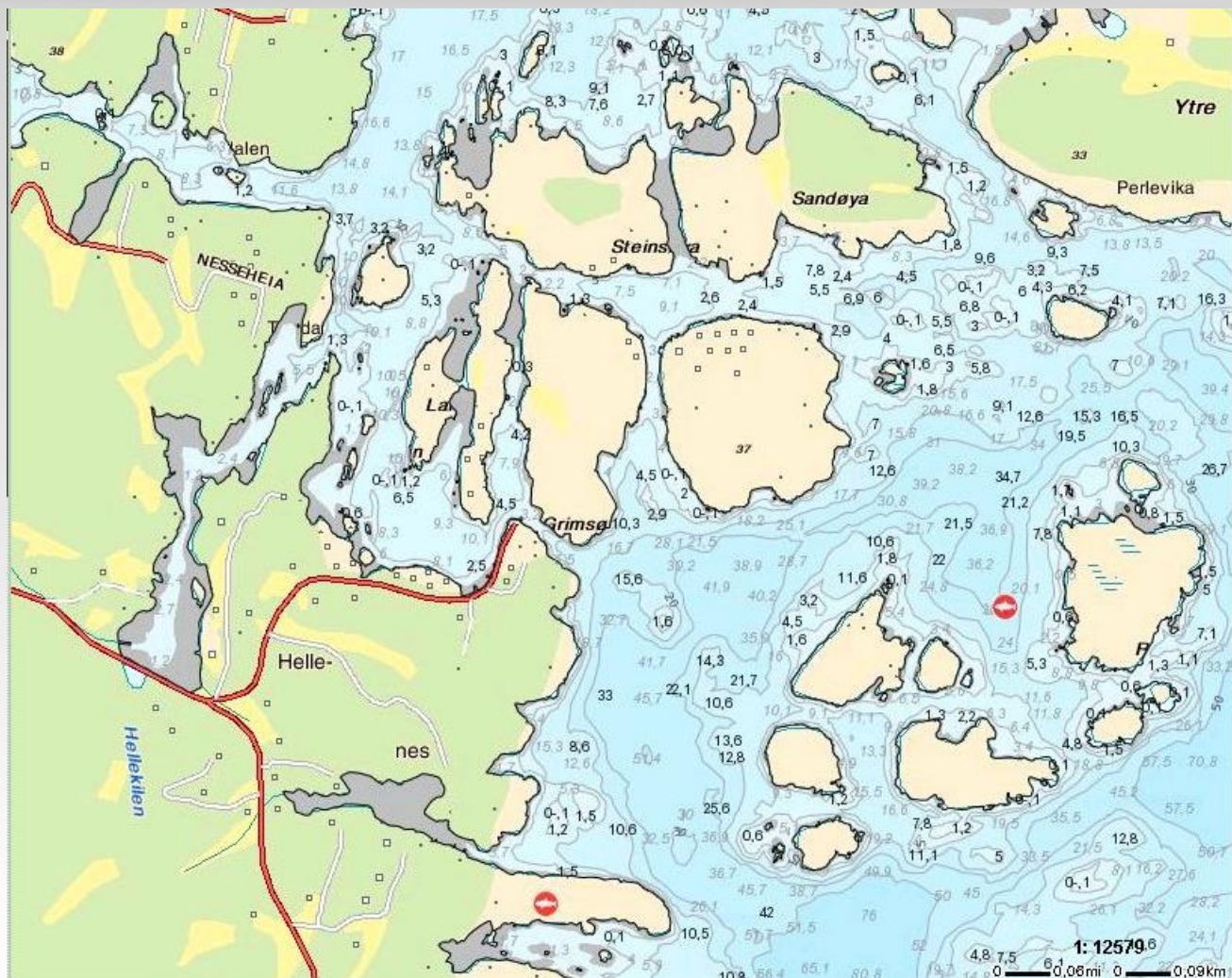




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# Integrating land and sea ...



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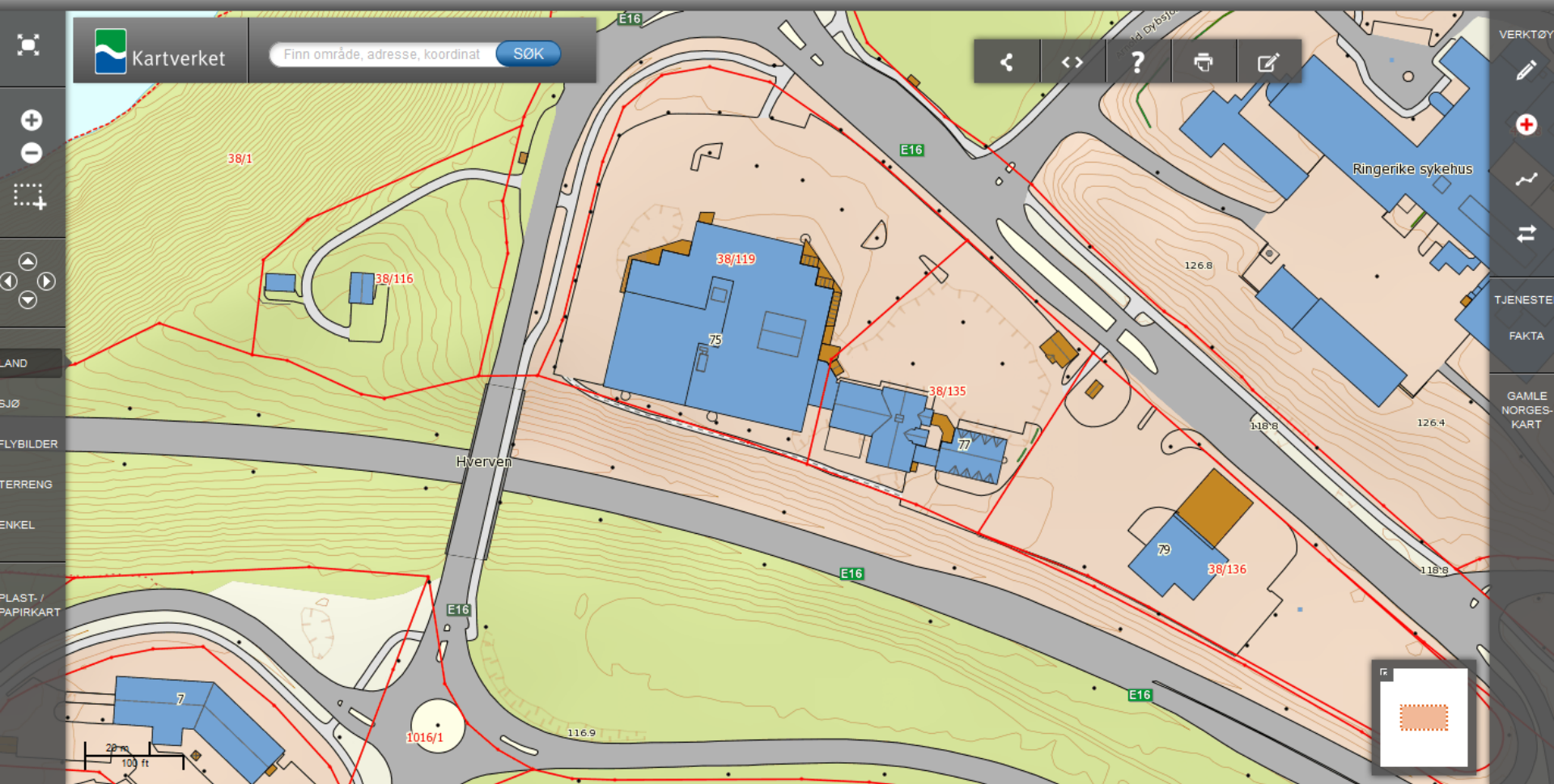




# Large scale base map



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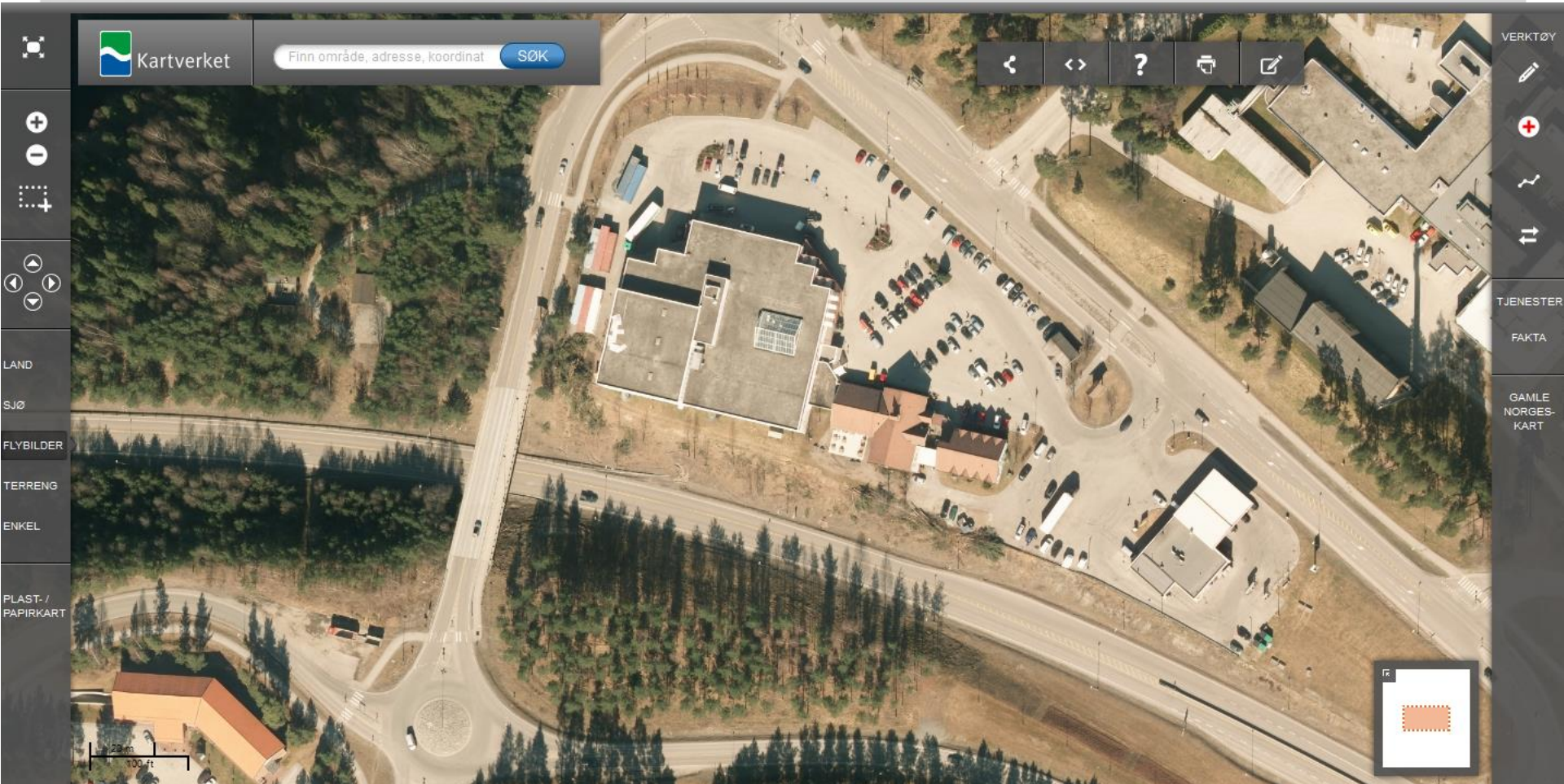


# Ortho imagery

## - up to 10 cm resolution



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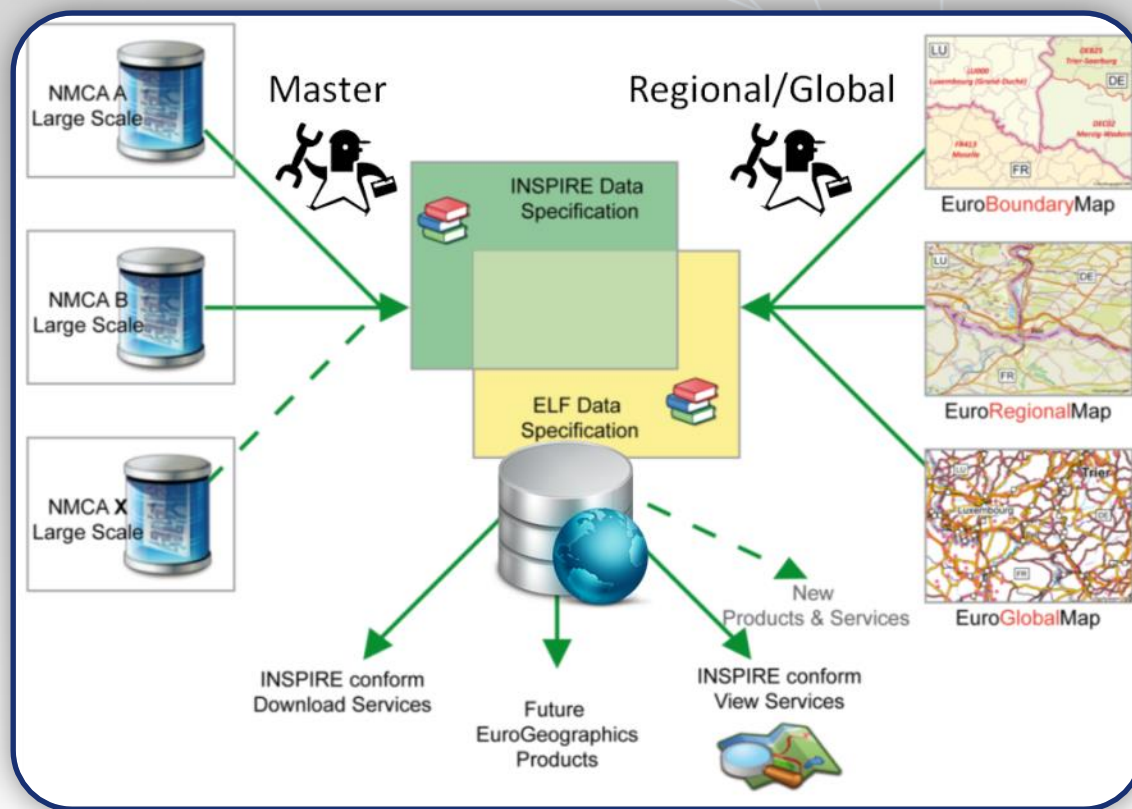
# Specifications - ELF



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- Data Specifications
- Data Maintenance and Processing
- Specifications for Content Services



CONTENT

# Data content – ELF



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Content		Products & Services		
LoD	Theme	Data		Services
ELF Global	Administrative Units	EuroGlobalMap	ELF Platform and Cloud	Web Maps
	Hydrography			
	Named Place (GN, POP)			
	Transport Network			
ELF Regional	Administrative Units	EuroBoundaryMap		Data Services (View and Download)
	Hydrography	EuroRegionalMap		
	Named Place (GN, POP)			
	Transport Network	EuroDEM		
	Elevation			
	Vegetation	ELF Int. Boundaries		
	Miscellaneous			
ELF National	Administrative Units	ELF TopoRaster50		ELF Basemap
	Hydrography			
	Named Place (GN, POP)			
	Transport Network	ELF Int. Boundaries	Geolocator Service	
	Elevation			
	Building			
	Cadastral Parcels	ELF Cadastral Europe		
	Addresses			
	Utilities and Gov Services			
	Other			



# INSPIRE



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# Drafting teams



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ICELAND  
LIECHTENSTEIN  
NORWAY  
eea  
grant



- Metadata  
Per Ryghaug, NGU
- Data specifications  
Arvid Lillethun, Kartverket
- Network services  
Olaf Østensen, Kartverket
- Data sharing  
Laila Aslesen, Kartverket
- Monitoring and reporting
- Olaf Østensen responsible for the first technical guidance on download services and for the draft implementing rule on spatial data services



# How standards matter, the INSPIRE example



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INSPIRE DIRECTIVE

IMPLEMENTING RULES

TECHNICAL  
GUIDANCE

STANDARDS



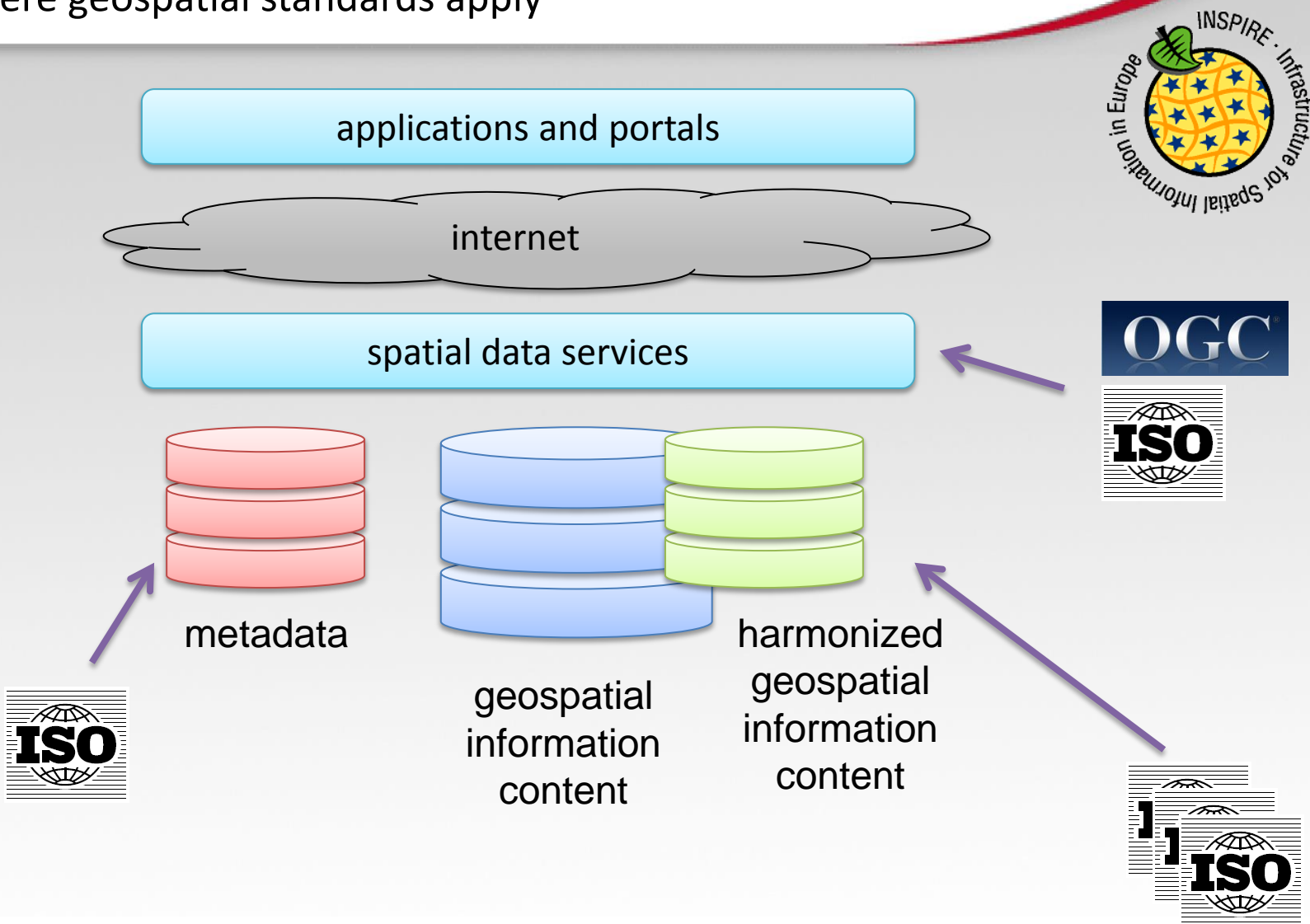
Legal regulations, have to be implemented in  
national regulations

# Simplified architecture

- and where geospatial standards apply



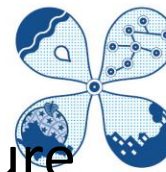
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# Norway Digital

## - the national geographical infrastructure



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- The Norway digital collaboration started in 2005
- More than 600 partners of Norwegian public authorities:
  - National (45)
  - Municipalities (428)
  - Counties (18)
  - Electricity companies (123)
  - Sami Parliament, the Finnmark Estate (2)
- This initiative enhances the availability and use of quality geographic information
- NMA provides delivery services to non-partners

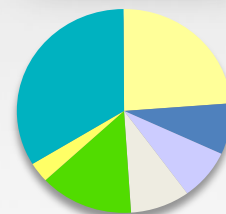
# Background



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- In 1986 the first version of a **national standard** for data-exchange "SOSI" – was introduced  
Ensures a common reference for an adaptation to international standards
- In 1991-92 NMA implemented the new "FKB- standard" - and at the same time the **Geovekst cooperation** for cost-sharing for establishment and updating of GI.  
NMA is coordinating the procurement-process.
- In 1996-2001 NMA managed a program for documentation of **thematic information** – followed up as "Arealis co-operation" until 2005
- From 2001 NMA accomplished several advanced **R&D-projects** – which has contributed to the development of the geoNorge portal and a wide range of services





# The clue – pick some main partners – close cooperation



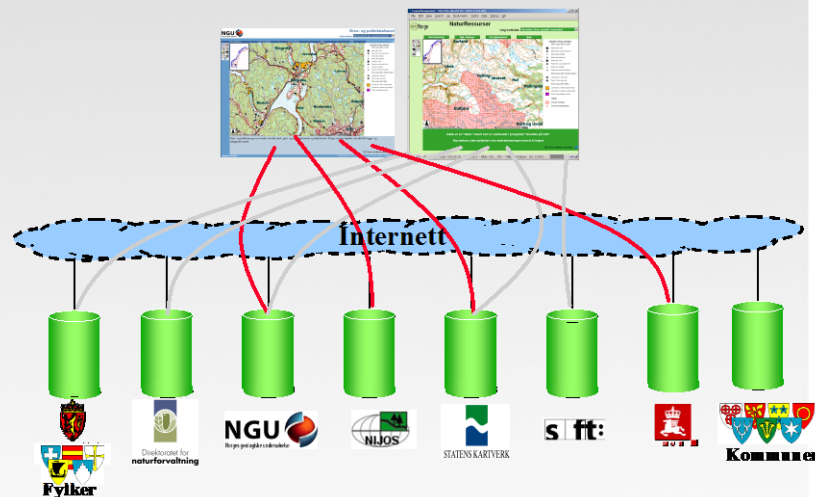
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- Directorate for Nature Management
- The Geological Survey of Norway
- The Norwegian Water Resources and Energy Directorate
- The Norwegian Forest and Landscape Institute
- The Directorate for Cultural Heritage
- The Norwegian Pollution Control Authority
- Norwegian Mapping and Cadastre Authority
- Public Roads Administration

also

- Statistics Norway
- County authorities
- Local authorities (municipalities)
- ++ many other interested and complying !



# Service based infrastructure

- metadata
- view services
- download services

Public sector, national and European

Citizens and private sector



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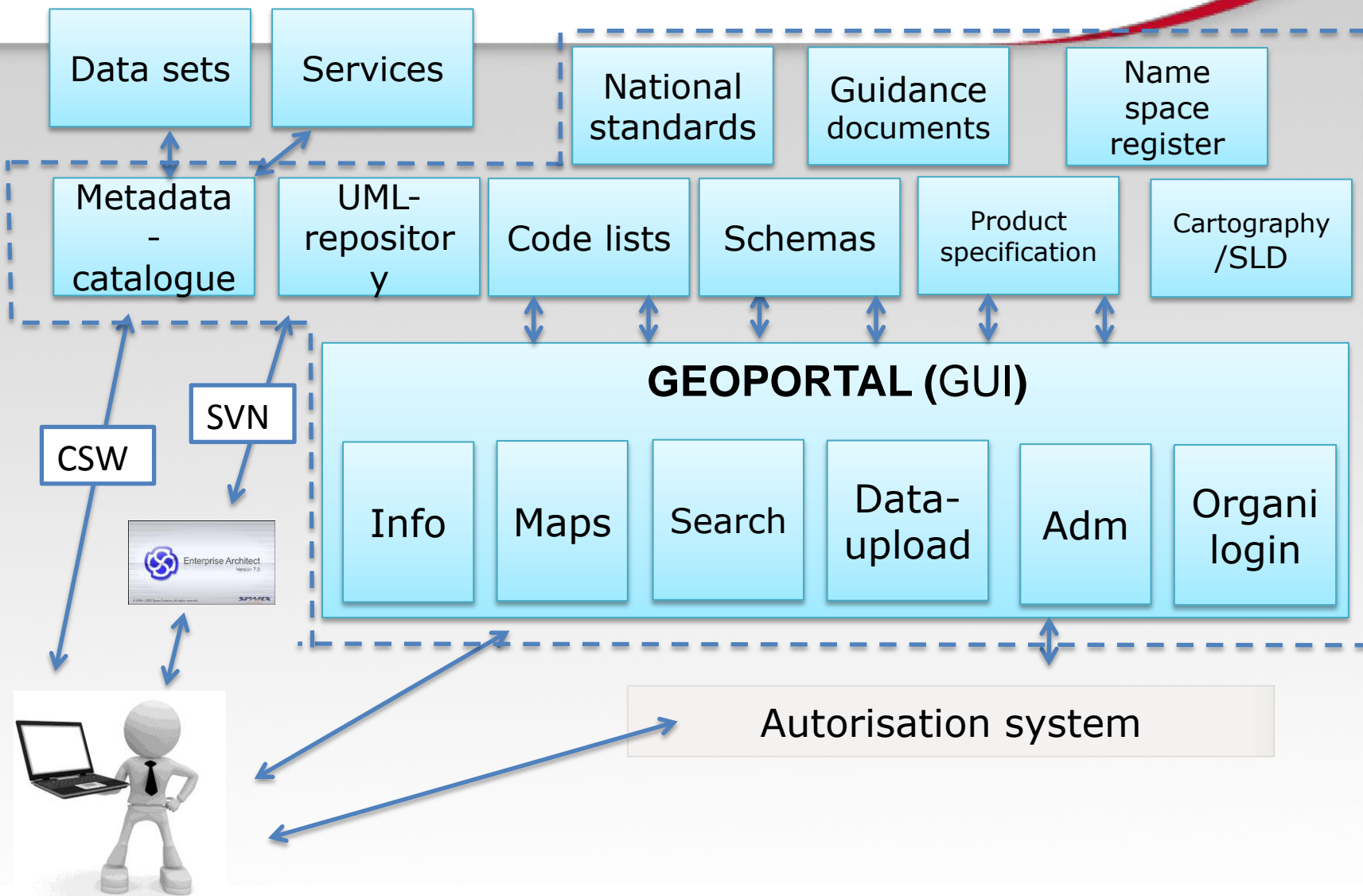
Direktoratet for  
naturforvaltning



# GeoPortal



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# Hydrography



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# Hydrography for us



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Picture from INSPIRE Technical guidance on the theme hydrography

- Hydrography an integrated theme of
  - sea
  - lakes
  - rivers
  - and, their topology

# Charting Norwegian coastal and ocean areas



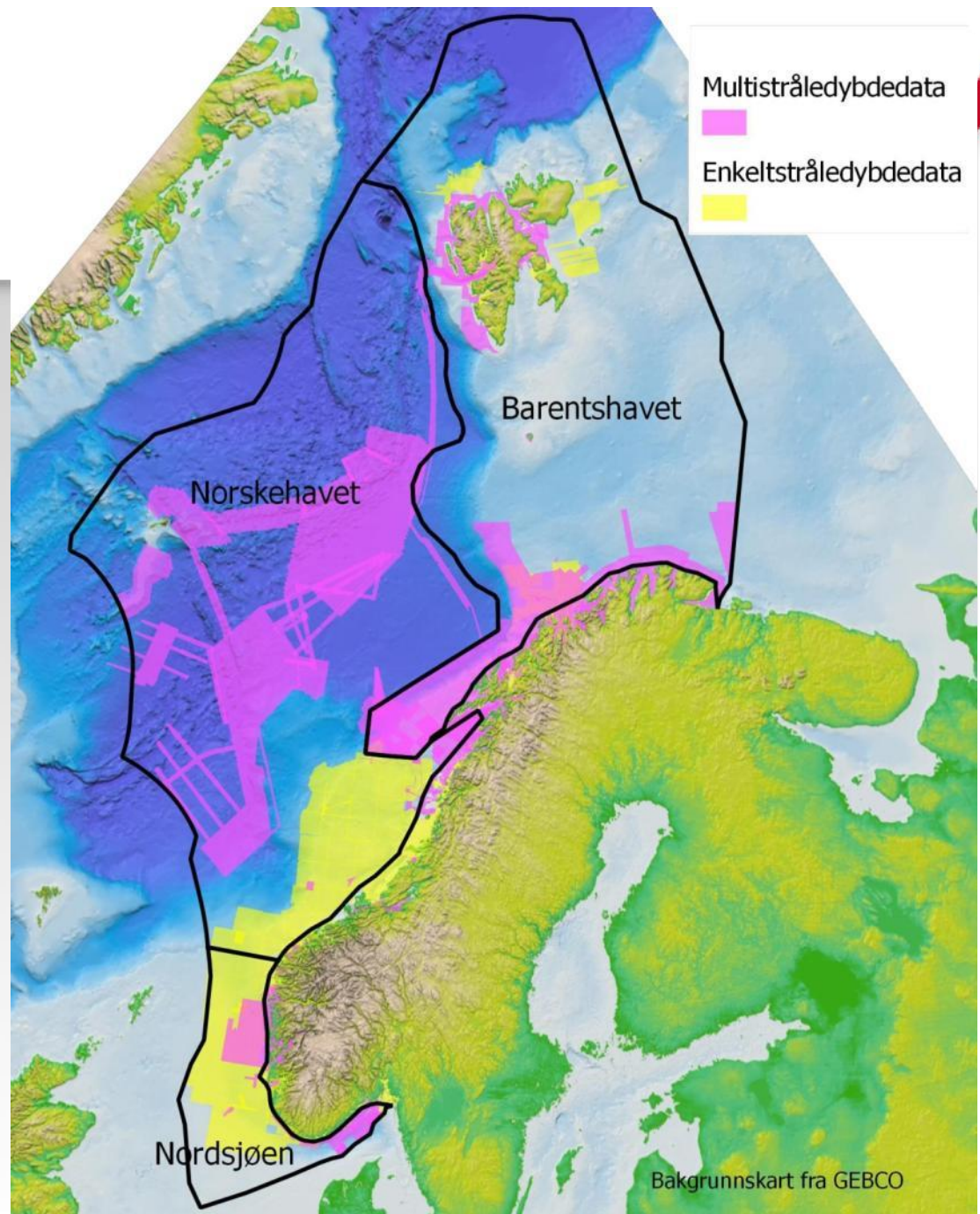
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# Area of responsibility

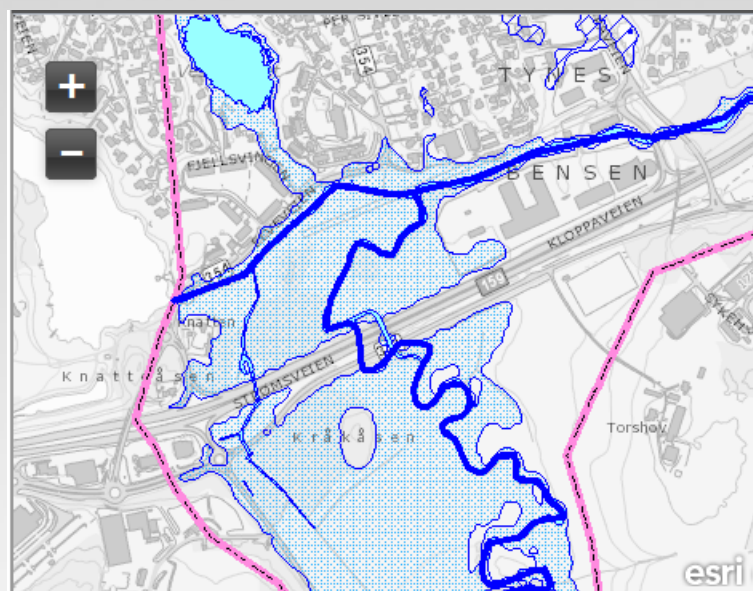
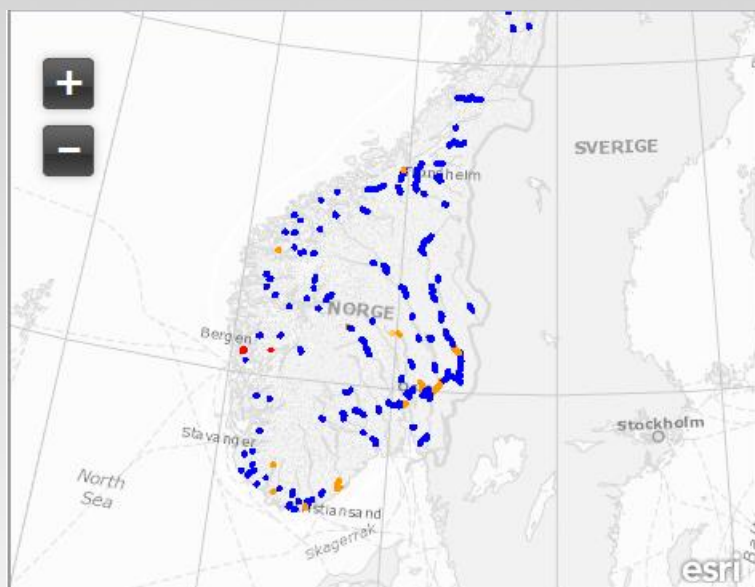
- Norwegian coastal and ocean areas: 2,4 mill. km<sup>2</sup>
- Mainland Norway: 324,000 km<sup>2</sup>



# Flooding zones



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The experts in Norway: Norwegian Water Resources and Energy Directorate  
a close partner in **Norway digital** and in daily operations

# Conclusion: The donor partners have...



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- broad experience
  - standards
  - data modelling
  - service building and operation
  - SDI building
  - co-operation in public sector
- broad commitment
  - EEA Grant
  - European affairs – EuroGeographics, Inspire, E.L.F.
  - International affairs – UN-GGIM



***... all this, and more, we will use to make your project a success!***