

# Norway digital implementing the national spatial data infrastructure – and Inspire



1st Croatian NSDI & INSPIRE Day - 26. November 2009  
Varazdin

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context

policy  
regulation

organ. &  
partners

standards

topic  
data

financing  
data

technical  
solution

# Context

- eGovernment strategies
- Building a system for easy access
- Services on the internet
- Relevant spatial data
- Broad use in public and private sector
- better decisions- more effective planning
- **The Norway digital - an example of a well-working system**



**context**

**policy  
regulation**

**organ. &  
partners**

**standards**

**data and  
use**

**financing  
data**

**technical  
solution**

# Policy and regulation

context

policy  
regulation

organ. &  
partners

standards

data and  
use

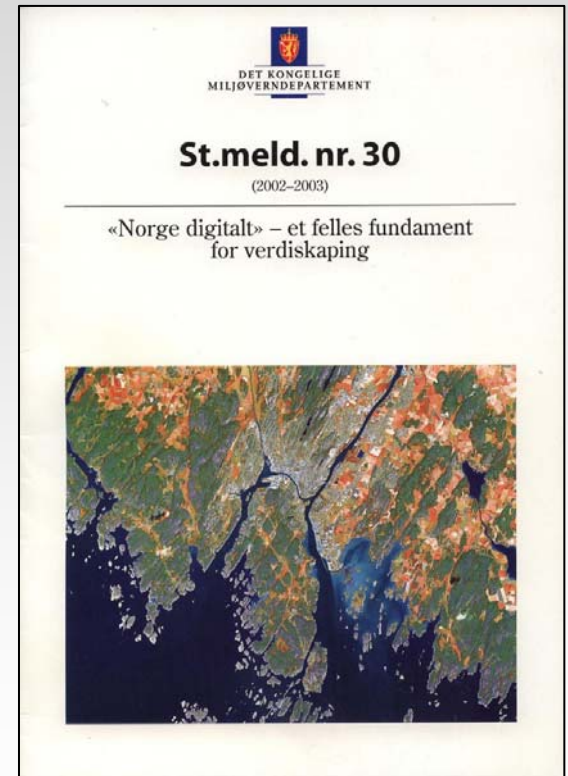
financing  
data

technical  
solution

# *The major concept in the White Paper is the establishment of the Norwegian SDI*

**«Norway digital» - a common fundament for value adding**

**The Parliamentary White Paper presented by the Norwegian government and accepted by the Parliament on June 18, 2003**



# New geodata legislation under development

context

policy  
regulation

organ. &  
partners

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technical  
solution

- NSDI Act is being developed
- Inspire -transposition into national law - 2010?



- **1. National needs – detailed data, broader and deeper content**
- **2. Inspire requirements – simplified data**

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solution**

# Organisation and partners

# «Norway digital»

## The NSDI organisation

context

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partners

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financing  
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technical  
solution

- 620 partners
- national
  - ◆ all ministries
  - ◆ national agencies
- regional
- municipalities
- state owned energy firms



# Easy access to all data

context

regulation

organ. & partners

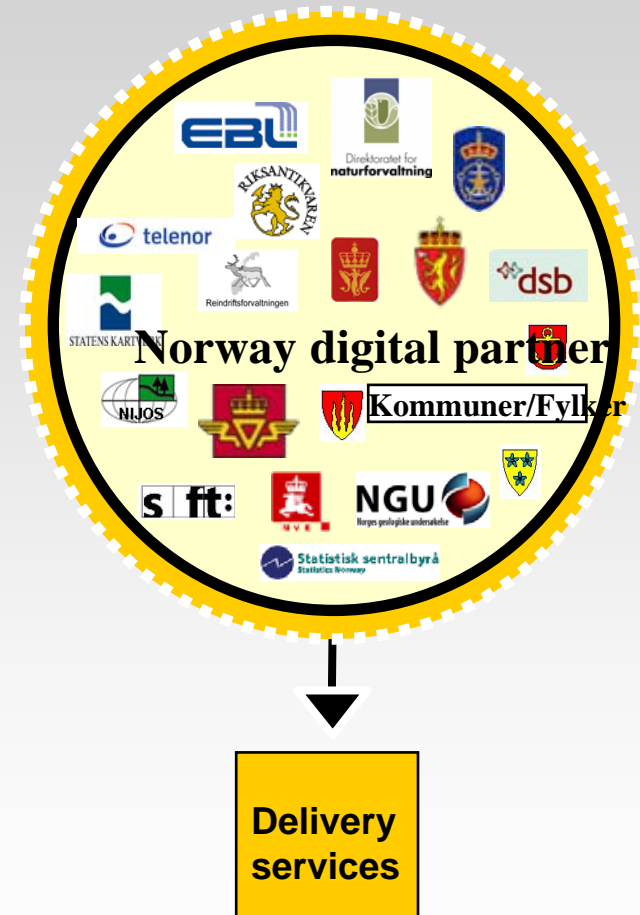
standards

data and use

financing data

technical solution

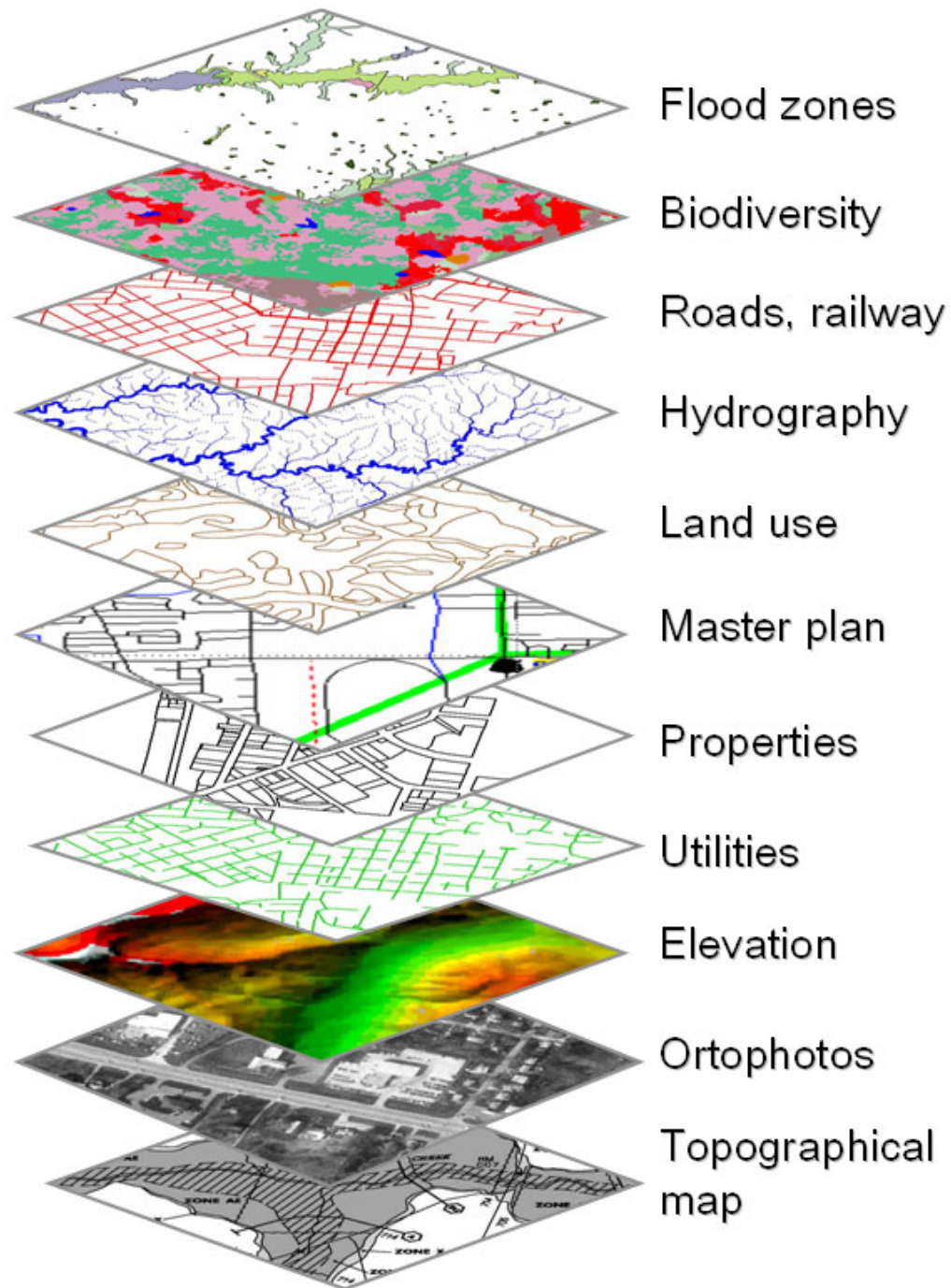
- each organisation pay a yearly entry fee
- all partners share all data
- Mapping agency data to all partners
- provide delivery services to non-partners
  - commercial
  - non-commercial





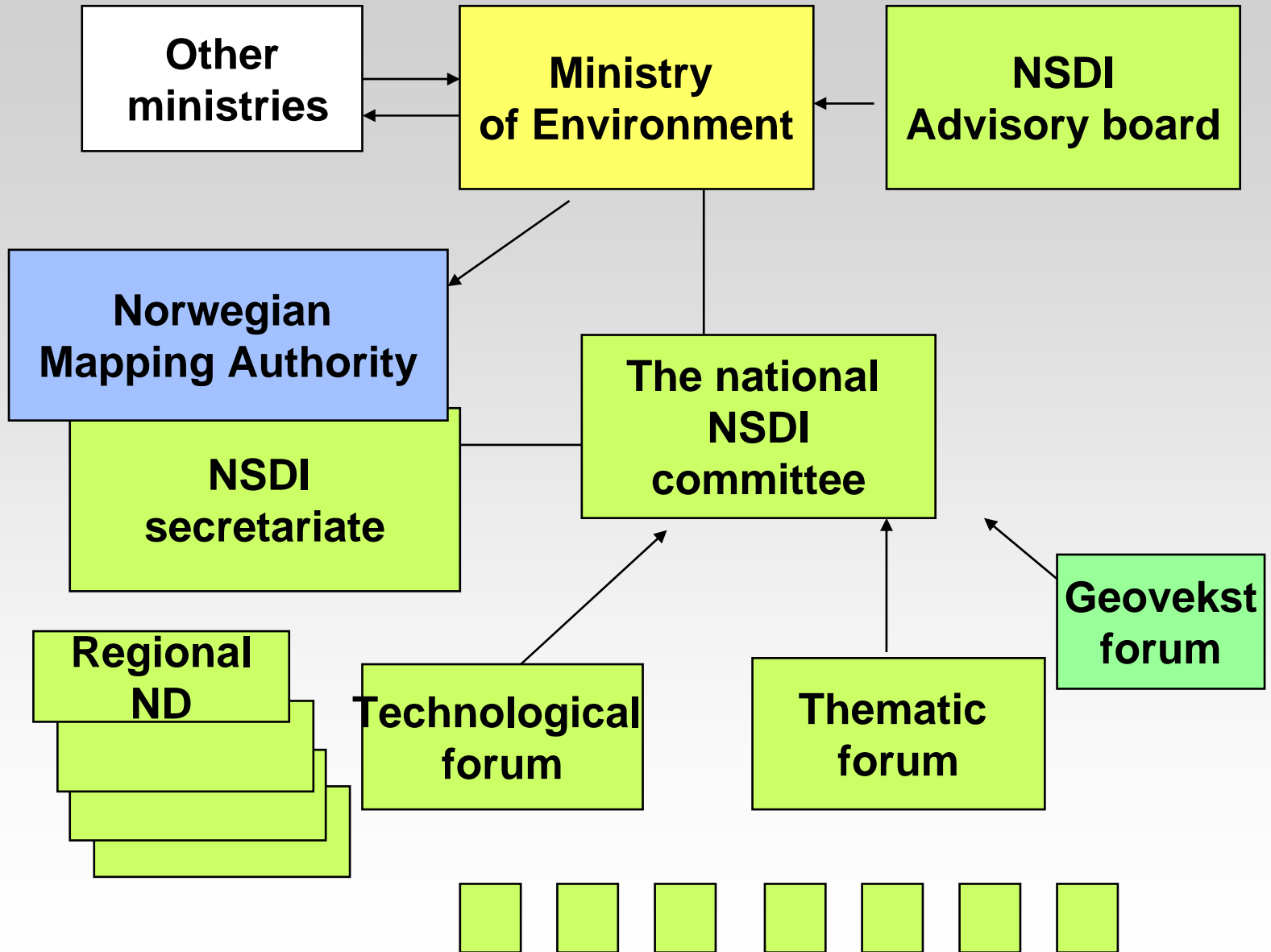
# Different layers are provided from different organisations

The National Inspire committee needs to define which national organisation are to be responsible for delivering each theme



# Norway digital organisation

context  
policy regulation  
**organ. & partners**  
standards  
data and use  
financing data  
technical solution



**context**

**policy  
regulation**

**organ. &  
partners**

**standards**

**topic  
data**

**financing  
data**

**technical  
solution**

# Standards

# Service based infrastructure

context

regulation

organ. & partners

standards

data and use

financing data

technical solution



Public sector, national and European



Citizens and private sector



# Long term standardisation

context

regulation

organ. &  
partners

standards

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data

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data

technical  
solution

- more than 15 years of standardisation - ISO
- textual specification and data models in national feature catalogue
- all relevant themes
  - ◆ reference data, topography, elevation, hydrography, property, building ...
  - ◆ heavy focus also on environmental issues....
- **Active use - being implemented in municipal and national databases**



# Broad participation

context

regulation

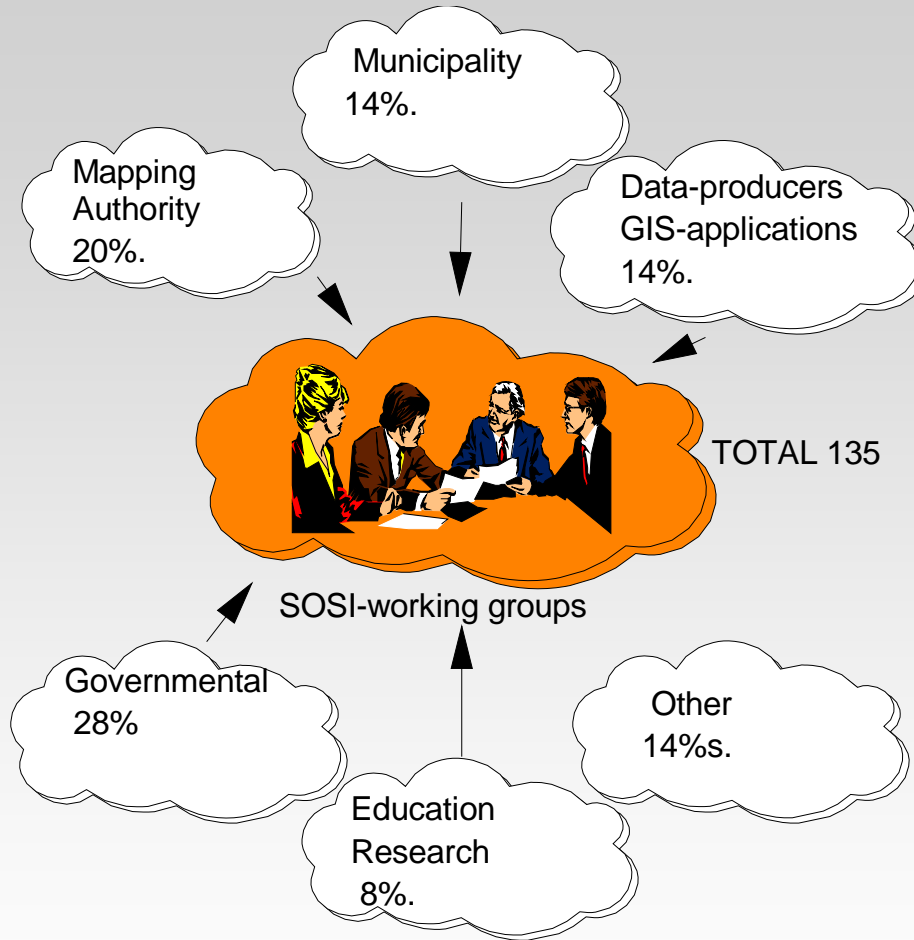
organ. & partners

standards

data and use

financing data

technical solution



**thematic standardisation committees – broad participation from government and industry - since 1993**

# NSDI technical working groups – all norwegian system providers participating



- users depend on a good relationship to private system providers
- mutual benefits - use their skills - they learn the new Inspire standards

context

regulation

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data

technical  
solution

**context**

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and use**

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data**

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solution**

# Spatial data and users



# A working infrastructure with lots of online services-wms/wfs

Variety of users and user applications

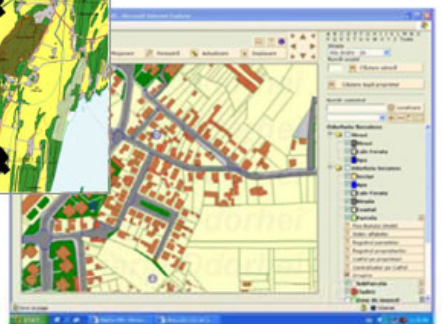
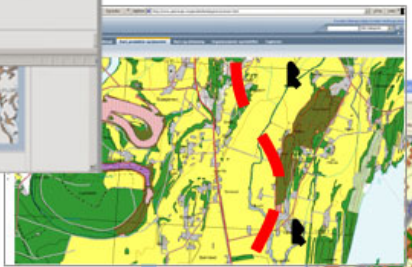
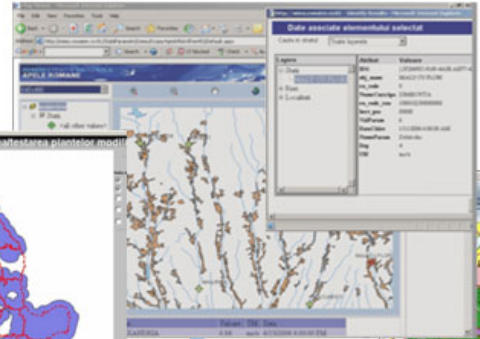
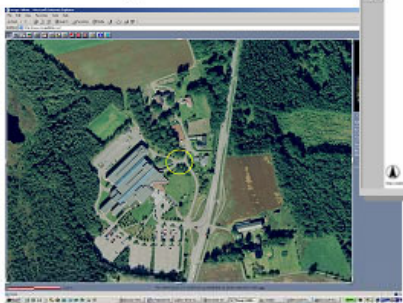
Regional administration systems

National planning applications

Environmental impact assessment applications

Local cadastral and master plan applications

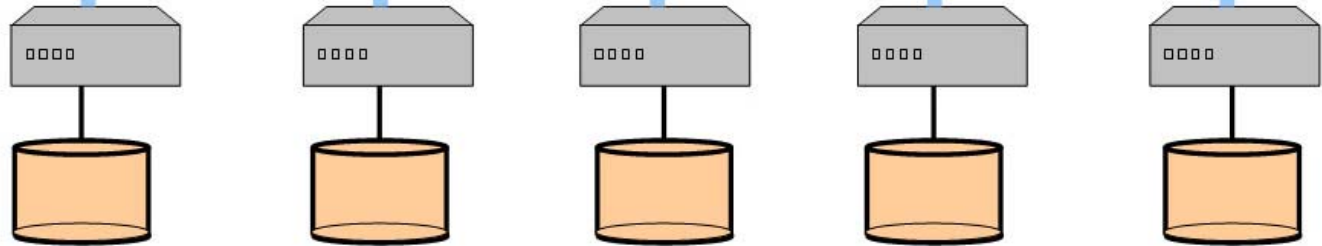
National web viewers for the public



National infrastructure - data connected to Internet as online services

Internet servers providing geodata services

Underlying spatial topographic or thematic databases



National and regional organisations owning and providing data

# Statistics - 2009 so far

context

regulation

organ. &  
partners

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data  
and use

financing  
data

technical  
solution

- Norway digital partners
- 200 different map services with national coverage
- with 2000 layers....
- Delivered through **Norwegian Mapping Authority** services:
- View services: 60 million wms-requests
- Tiled wms services: 170 million tiles since April
- Downloaded files: approx. 1 million

# Each municipality – system for property information, buildings, addresses

context

regulation

organ. & partners

standards

data and use

financing data

technical solution

Velkommen til Matrikkelen Torjan

Arkiv Vis Matrikkelenhet Krets Gate Område Adresse Bygning Bruker Hjelp

Matrikkelenhet: Grunneiendom

Matrikuler umatrikulert grunn som grunneiendom  
Opprett ny grunneiendom ved fradeling

Søk etter: Feste grunn, Seksjon, Registrer aktuell eier eller fester, Endre forretningsdata, Matrikkelenhet utgår

Består: Registrer aktuell eier eller fester

Bygning: Endre forretningsdata, Matrikkelenhet utgår

Adresse: Ommatrikuler matrikkelenhet, Forretning over eksisterende grense, Sammenføyning av matrikkelenheter på samme nivå

Husnr:

Alt navn:

Matrikkelenhet: Gnr:  Bnr:  Fnr:  Snr:

Hjemmelshaver / Bygningseier: Fødsels- eller org.nr:  Fornavn:  Etternavn:

Blank Søk

Nøkkel	Verdi
Type	Grunneiendom
Kommune	NITTEDAL
Gårdsnr	50
Bruksnr	7
Festnr	0
Seksjonsnr	0
Etablert dato	1914-12-16
Utgått	<input type="checkbox"/>
Oppgitt areal	0.0

Kommune: 0233 NITTEDAL Målestokk 1: 539 Koordinatsystem: 2 Nord: 236 961,46 Øst: 5 273,68

Linked to the NSDI

Type	Kommune	Gårdsnr	Bruksnr	Festnr	Seksjonsnr	Etablert dato	Utgått	Oppgitt areal	Beregnet areal
Grunneiendom	NITTEDAL	50	1	0	0	01.01.1873	<input type="checkbox"/>	0.0	196381.0
Grunneiendom	NITTEDAL	50	2	0	0	01.07.1873	<input type="checkbox"/>	0.0	0.0
Grunneiendom	NITTEDAL	50	3	0	0	24.06.1898	<input type="checkbox"/>	1950.0	2065.6
Grunneiendom	NITTEDAL	50	4	0	0	07.01.1909	<input type="checkbox"/>	1586.0	1586.3
Grunneiendom	NITTEDAL	50	5	0	0	11.09.1914	<input type="checkbox"/>	0.0	1983.3
Grunneiendom	NITTEDAL	50	6	0	0	16.12.1914	<input type="checkbox"/>	0.0	186699.3
Grunneiendom	NITTEDAL	50	7	0	0	16.12.1914	<input type="checkbox"/>	0.0	4431.5
Grunneiendom	NITTEDAL	50	8	0	0	16.12.1914	<input type="checkbox"/>	607.0	618.3
Grunneiendom	NITTEDAL	50	9	0	0	16.06.1915	<input type="checkbox"/>	1967.0	1967.0
Grunneiendom	NITTEDAL	50	10	0	0	23.08.1916	<input type="checkbox"/>	0.0	9954.3

context

# Maps for all farmers

regulation

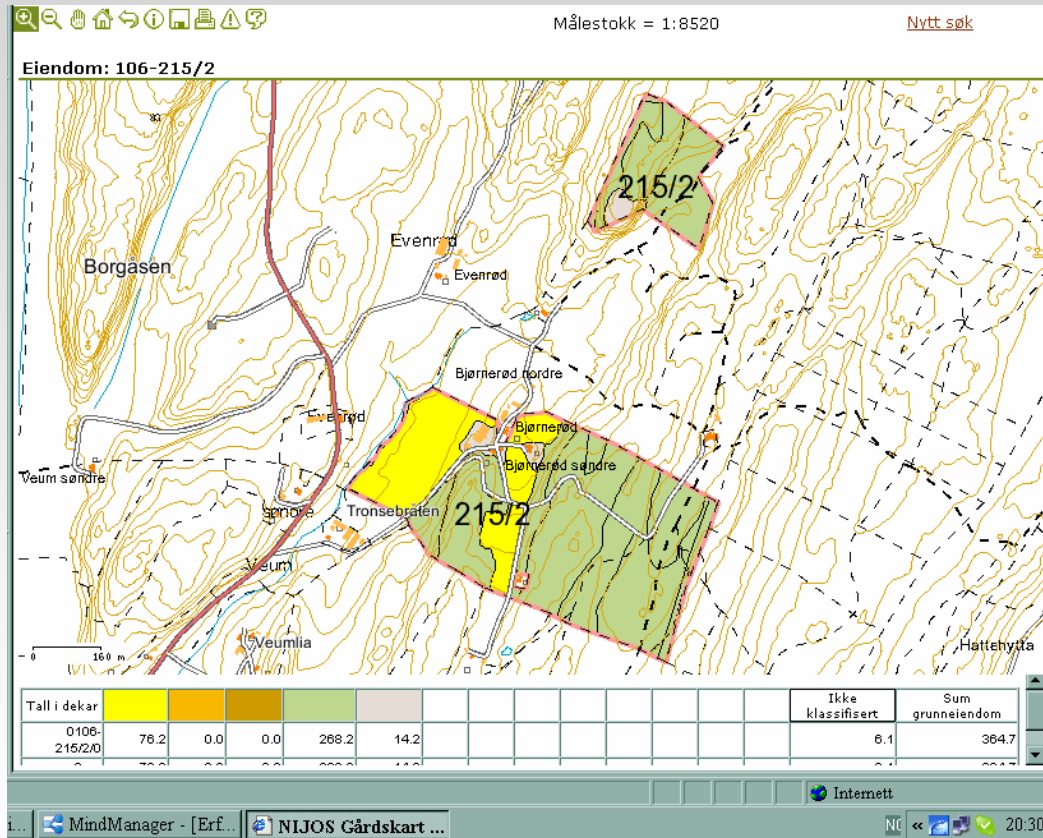
organ. & partners

standards

data and use

financing data

technical solution



- internett solution
- each farmer get map of own land, property, fields
- statistics for own land

context

# Use in all municipalities

regulation

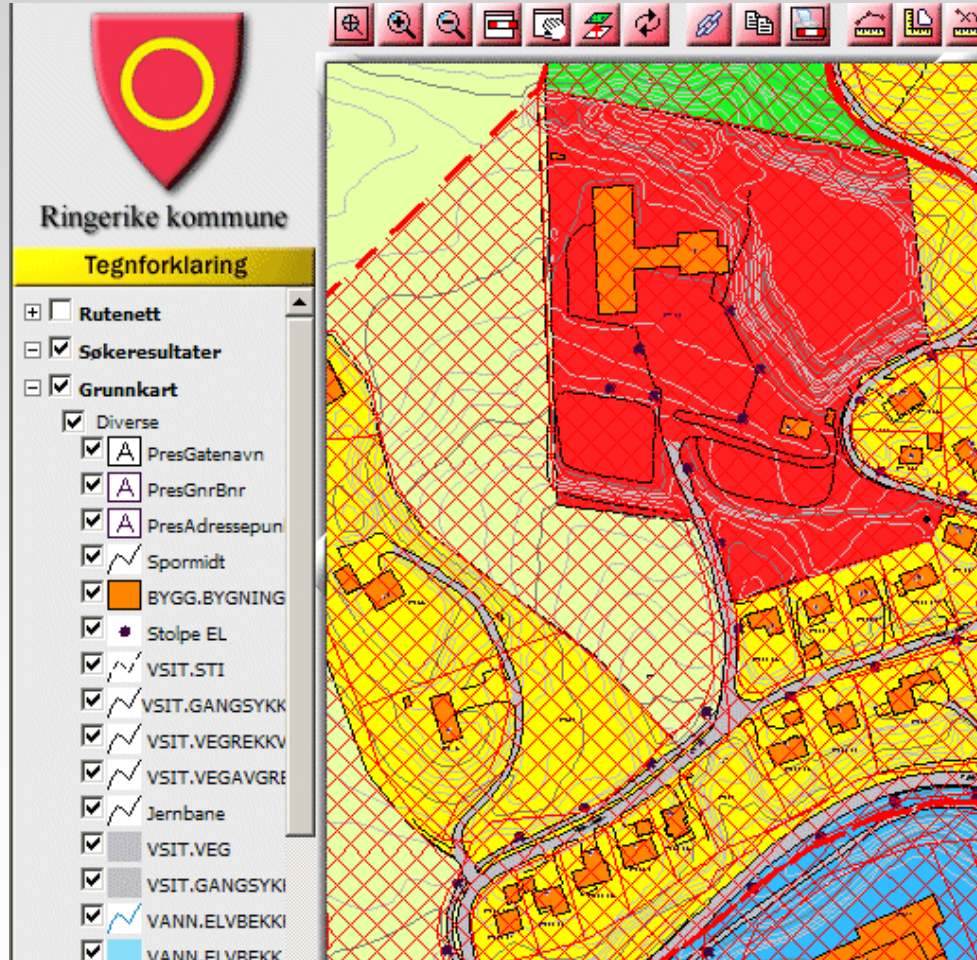
organ. & partners

standards

data and use

financing data

technical solution



- large volume
- in land use planning
- following building act

# Educational maps

agreement with the Directorate for Education

context

regulation

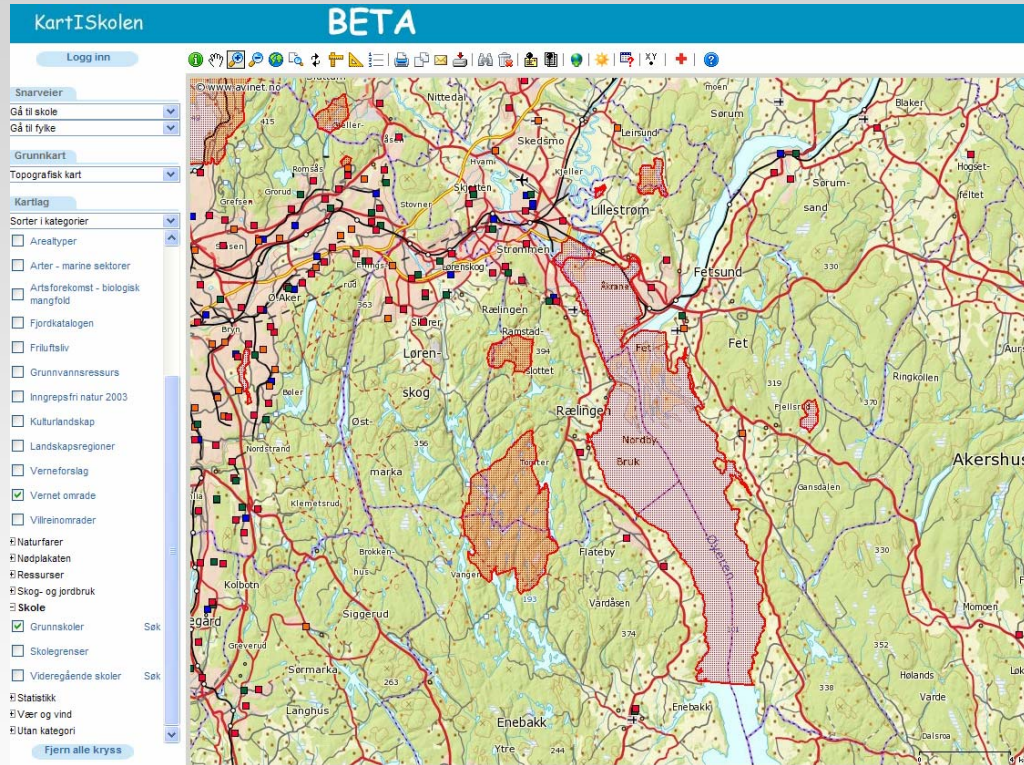
organ. & partners

standards

data and use

financing data

technical solution



Access for all pupils

# geoDep – for the Ministries

context

regulation

organ. & partners

standards

data and use

financing data

technical solution

The screenshot displays the geoDep web application interface. At the top, there is a header with the logo and the text "Kartløsning for departementene". Below the header is a toolbar with various navigation and tool icons. The main area is a map showing a coastal region with buildings, roads, and water. The map is overlaid with various data layers, including depth contours and navigational markers. On the left side, there is a sidebar with several menu items and checkboxes, including "Gå til målestokk", "Gå til område", "Velg grunnkart", "Sorter tema", and "Oppdater kart". On the right side, there is another sidebar with a list of categories and their corresponding information links, such as "Havstrømmer", "Naturvernområder", "Petroleum utvinningstillatelser", "AIS - Kystvakt", "Sjøgrenser offisielle", and "Sjøgrenser uoffisielle".

# Flood zones - wms

context

regulation

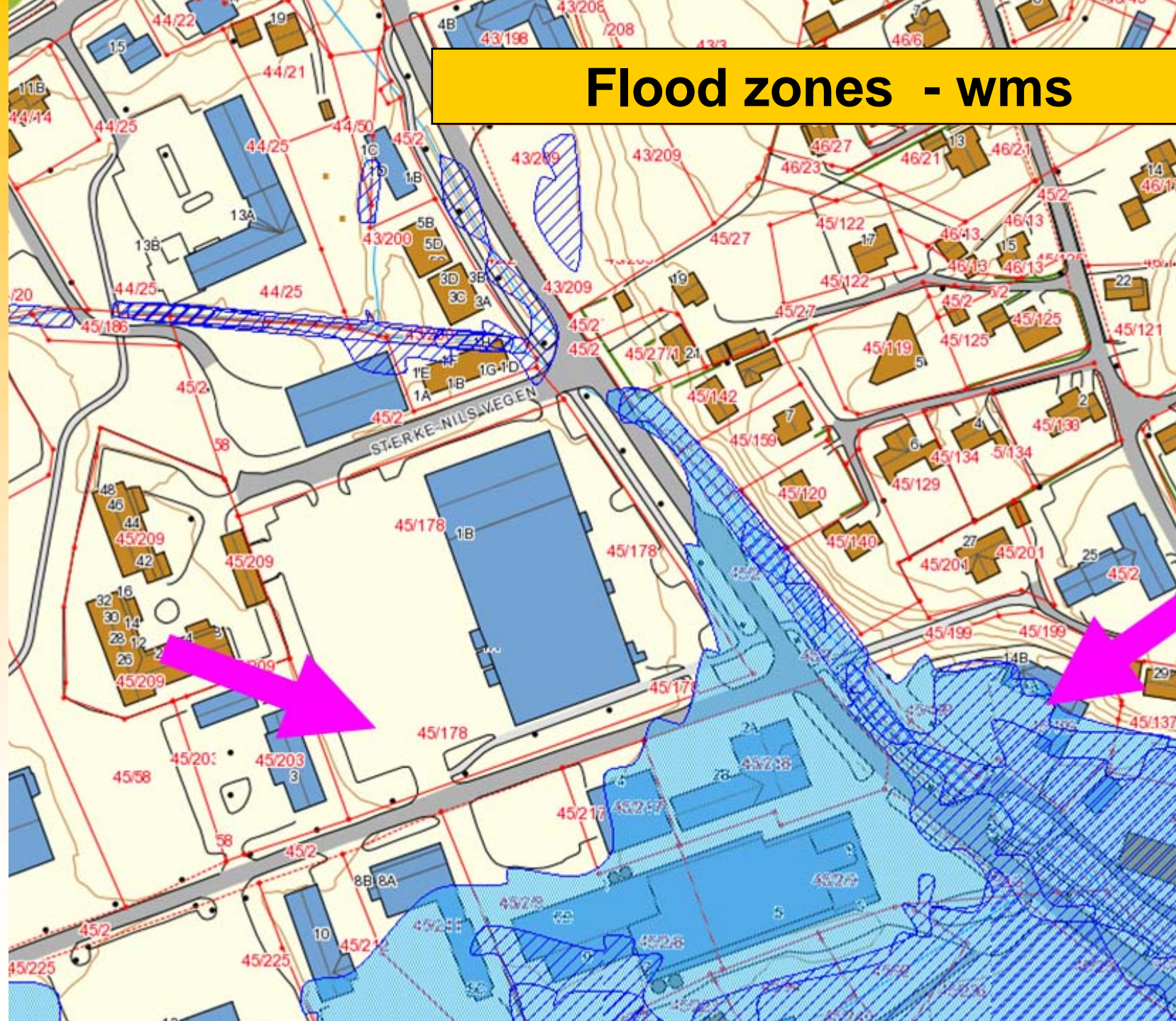
organ. & partners

standards

data and use

financing data

technical solution





context

**Air photos over time, can be used to detect  
pollution, land fillings etc**

regulation

organ. &  
partners

standards

**data  
and use**

financing  
data

technical  
solution



# Cultural heritage

context

)  
n og Fjordane inneheld desse lokale tema  
egionalt nivå: Kulturminne / Attraksjonar, Friluftsliv  
Regionalt viktige kulturlandskap, Kulturlandskap i  
ogn og Fjordane, Kulturlandskap i kommunane

regulation

er (WMS) (Wms)  
n er underlagt fredningsbestemmelser. Består av  
e kulturminner- Fredete bygninger (inkluderer også  
dtaksfredete kulturminner- Vedtaksfredete

organ. &  
partners

is)  
år 1900) som er registrert som kulturminne i det  
som ikkje er freda etter Kulturminnelova. I enkelte  
) er grensa for registrering sett lenger inn på

standards

psområder (Wms)  
iterte områdene i Nasjonal registrering av  
fatter 10-30 områder i hvert fylke, totalt ca. 300  
ajourført pr. september 2003, og vil bli fortløpende  
ttet inneholder utvalgte opplysninger fra et separat

data  
and use

- Landskap (Wms)  
on om landskapsregioner. Regionene er avgrenset  
: ved analyser av samspillet mellom naturgitte og  
imen utformer og danner et landskapsbilde. Studiet  
onenter (landskapets hovedform, småformer,

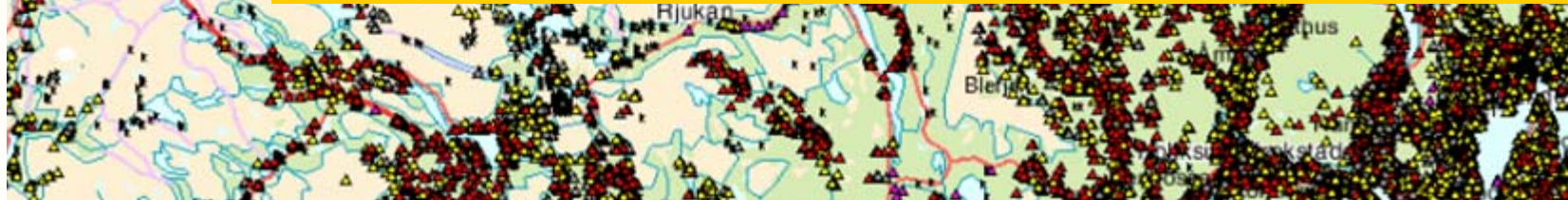
- MiS-figurer (Wms)  
r fra skogbruksplanlegginga

ter |  Søksvar i eget

financing  
data

**Large volume recordings  
– 500.000 registrations**

technical  
solution



# Biodiversity and protected sites - detailed map information

context

regulation

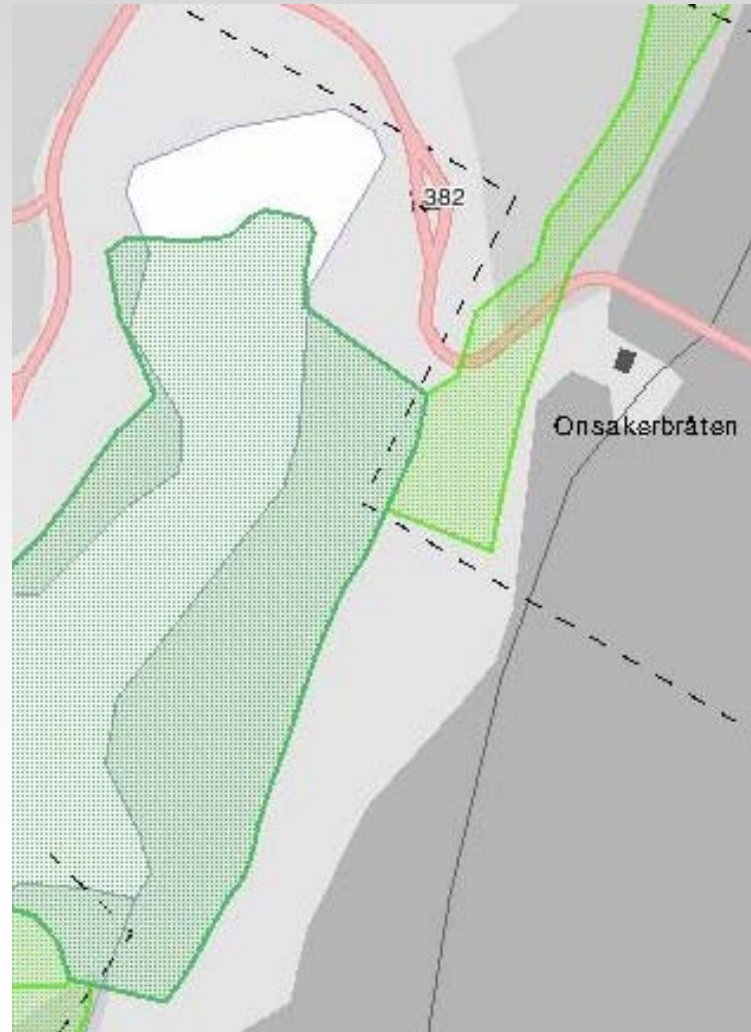
organ. &  
partners

standards

data  
and use

financing  
data

technical  
solution



Biodiversity  
localities - exact  
location within  
properties

**context**

**regulation**

**organ. &  
partners**

**standards**

**data and  
use**

**financing  
data**

**technical  
solution**

# **Financing of data and infrastructure**

context

# Financing the NSDI

regulation

- **Ministry of Environment**
  - ◆ coordination cost
- **Each ministry – underlying national agencies**
  - ◆ responsible for own data
- **Geovekst and Norway digital**
  - ◆ cost sharing
- **Municipalities**
  - ◆ Cadaster and master plans
- **Pricing**
  - ◆ Sales of data to private firms
  - ◆ All environmental data free of charge
  - ◆ Online services with raster maps free of use
  - ◆ Charging for download of data
- **All revenue used to update data**

organ. & partners

standards

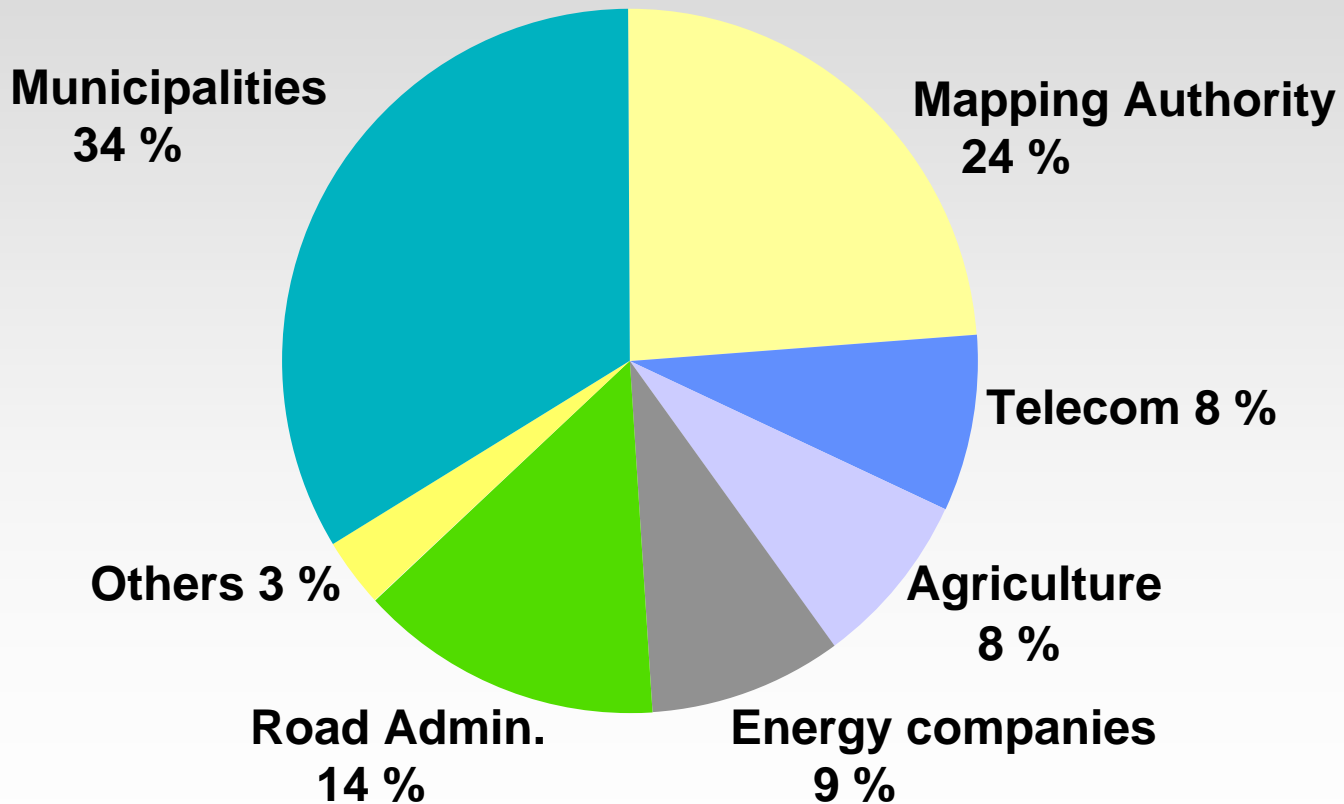
data and use

financing data

technical solution

# Long tradition of national co-operation – 15 years

– e.g. Geovekst, cost-sharing for establishment and updating of GI



Large scale geographic information

context

regulation

organ. & partners

standards

data and use

financing data

technical solution

# Technical issues of the infrastructure

context

regulation

organ. &  
partners

standards

data and  
use

financing  
data

technical  
solution

# National geoportal

context

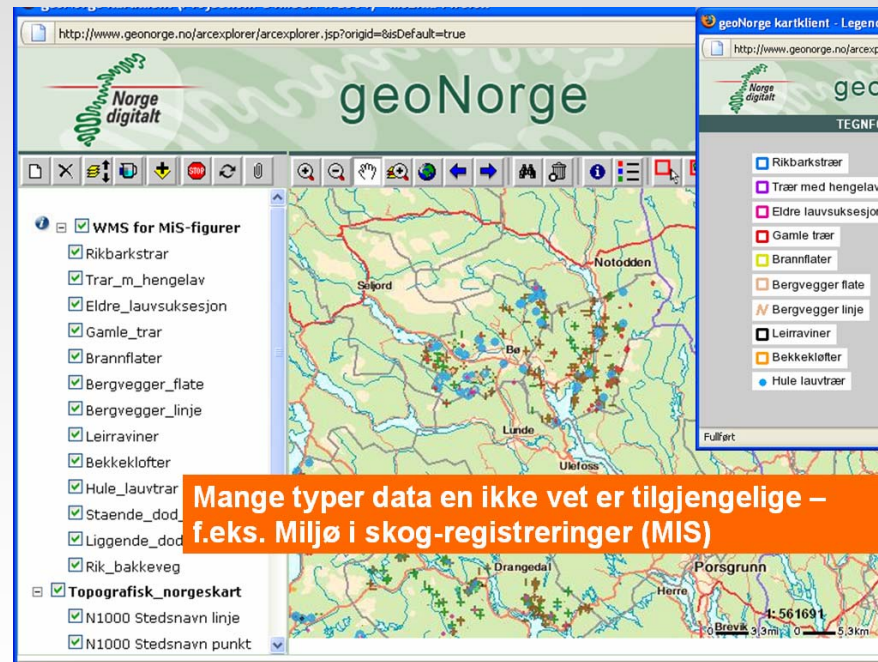
- Overview of all available data and web map services (WMS/WFS)

regulation

- **The geoportal is not an end-user application – most users will never use the geoportal**

organ. & partners

standards



topic data

financing data

technical solution

- New development 2009-2010 - based on open source geoNetwork – system to system communication (catalogue service web CS-w)



# Infrastructure based on online services

context

regulation

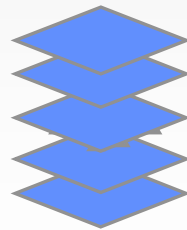
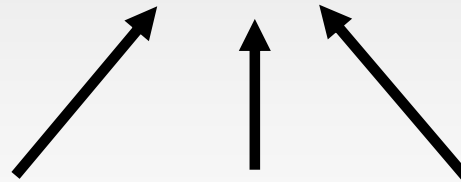
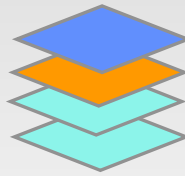
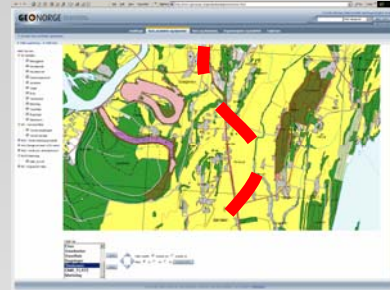
organ. & partners

standards

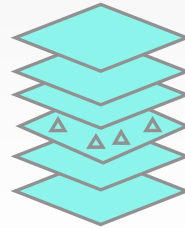
data and use

financing data

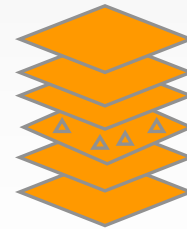
technical solution



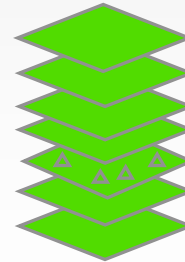
Pollution authority



Mapping agency



Municipality



Agric authority

- *WMS/ WFS*  
*Web map services specified by ISO and Inspire*

# Developing faster access, better services

context

regulation

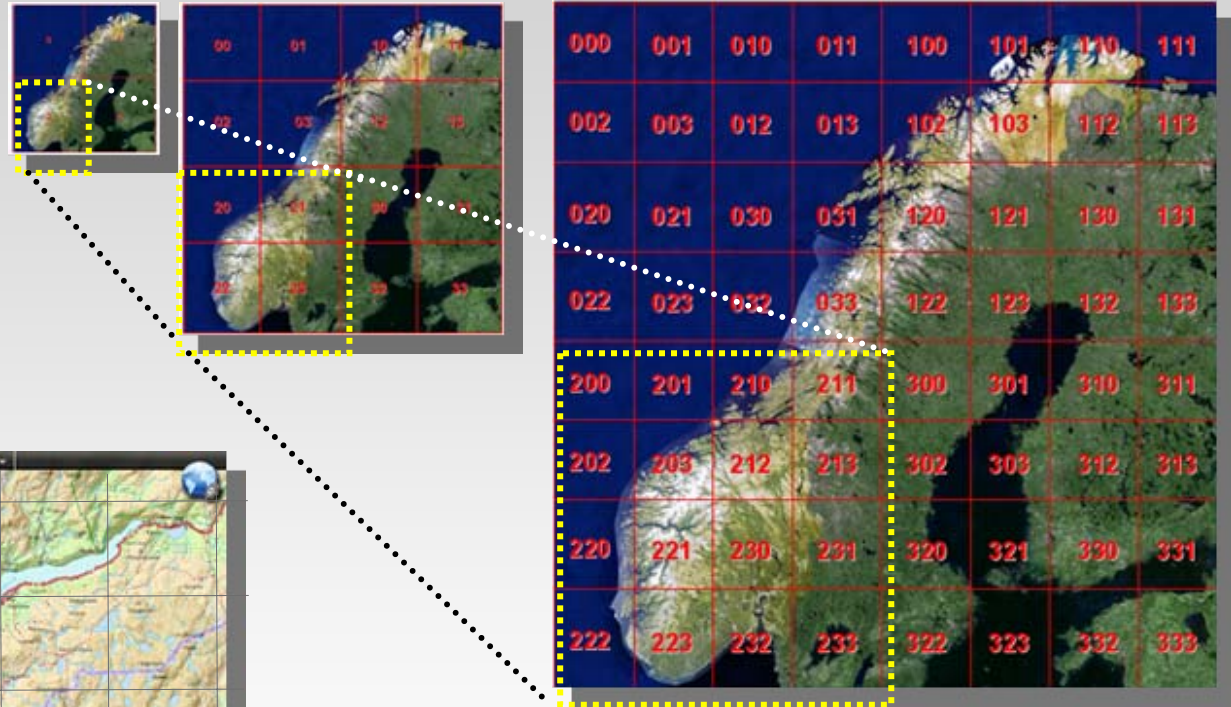
organ. &  
partners

standards

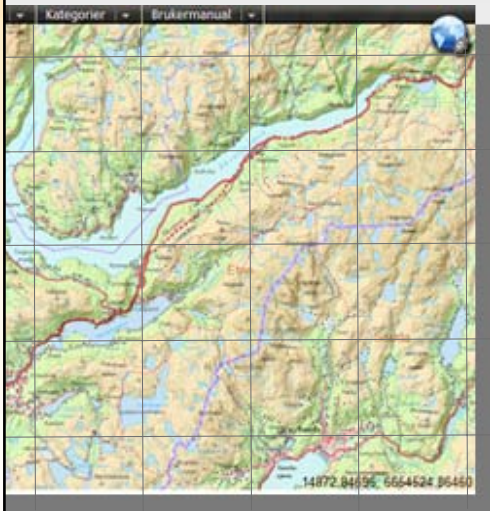
data  
and use

financing  
data

technical  
solution



Google feel-alike view services



# summing up

- **step by step**
- **long term**
- **follow international standards – Inspire**
- **broad cooperation**
- **respect each others fields**
- **good will**

# Links – Norwegian solutions

- [www.geonorge.no](http://www.geonorge.no)
- [www.kartiskolen.no](http://www.kartiskolen.no)
- <http://www.norgebilder.no/>
- <http://kart.kystverket.no/>
  
- [www.norgedigitalt.no](http://www.norgedigitalt.no)
- [www.statkart.no](http://www.statkart.no)

**Many thanks for your attention!**

