



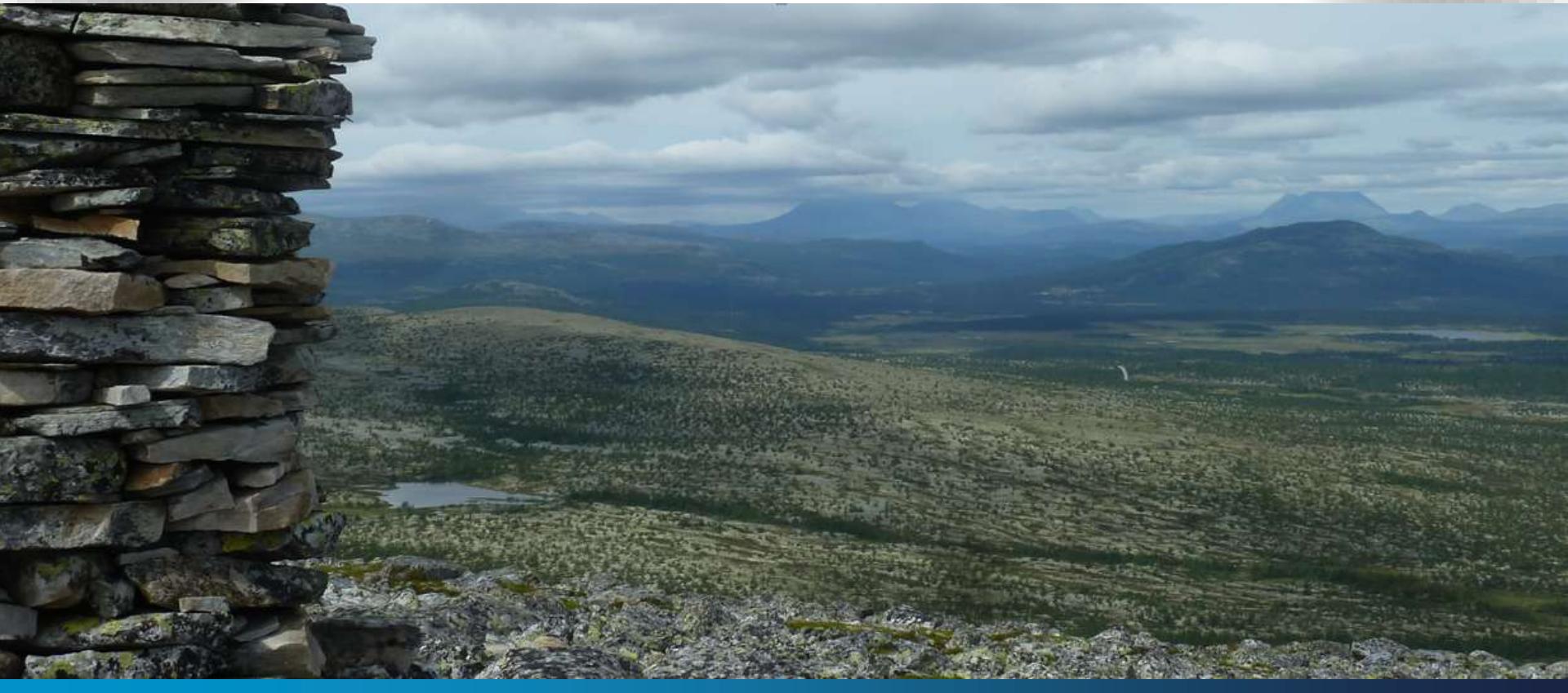
Kartverket

Inspire for statistical offices



8.5. 2014

Arvid Lillethun, Norwegian Mapping Authority



Issues

- Inspire background
- Inspire directive and docs
- Inspire themes and deliverables
- Inspire data specifications
- Inspire harmonisation
- Example Demography
- ExamIpe Health
- Who to deliver



Inspire background and aim



What is Inspire?

- INfrastructure for SPatial InfoRmation in Europe
- A framework directive of the European Parliament and of the Council of 14 March 2007 (Directive 2007/2/EC) on the establishment of such a Spatial Data Infrastructure (SDI)
- DGEv, Eurostat, JRC, EEA

Purpose of Inspire



- INSPIRE allows
 - spatial data to be comparable across regions, a country and Europe
 - decision makers to get consistent evidence about the environment
 - Primarily environment, but also broad use in other sectors
 - Open data and easy access

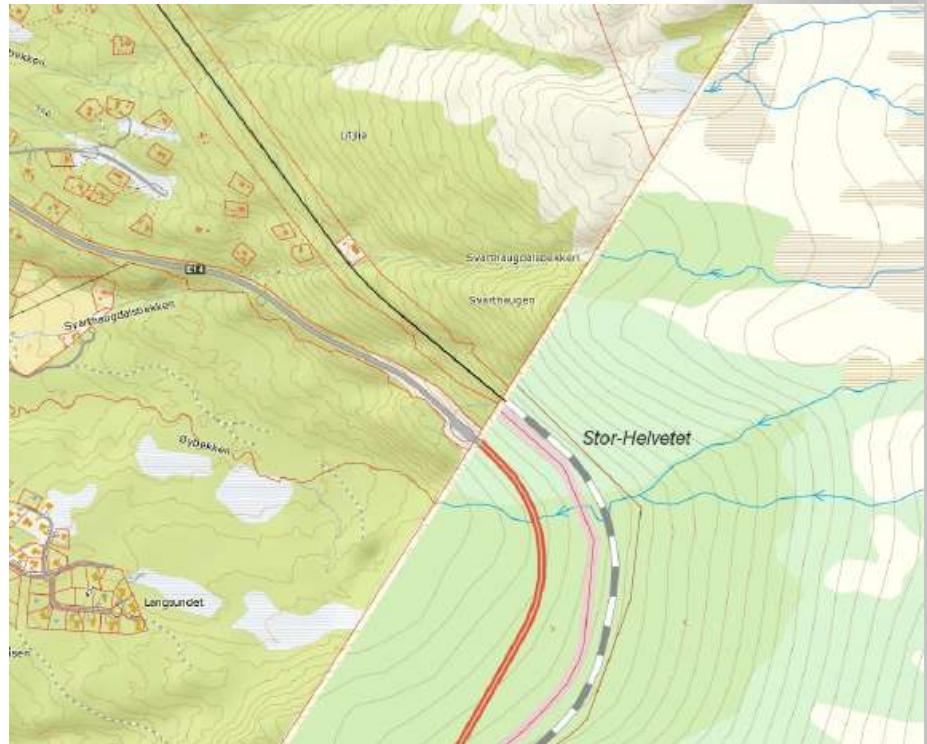
User needs

- International use
 - Policy maker
 - Manager
 - researcher
- Cross-border use
- Country use
 - Policy maker
 - Administrative management
- Regional/ local use



Aim to develop

- Harmonised data
- Same structure
- Same catography
- Good documentation/ metadata
- Online web services

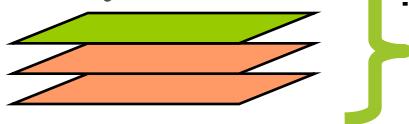


Service based infrastructure



Web map service (WMS)
Web feature service (WFS)
Web coverage service (WCS)
web service (WS)

integrasjon

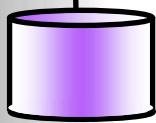


Map viewer or other user application

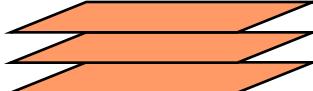


Internett

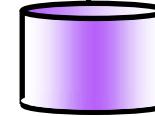
Map service



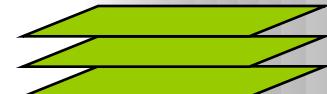
Administrative units
Background map
NMA



Map service



Grid demography data
Admin. area statistics
NSI

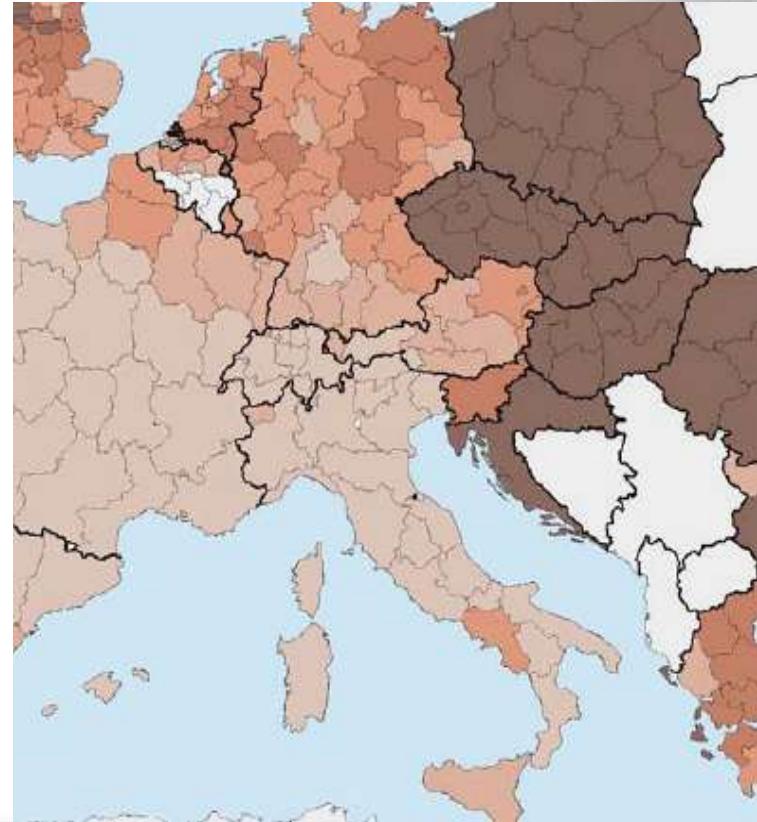


INSPIRE „non“- principles

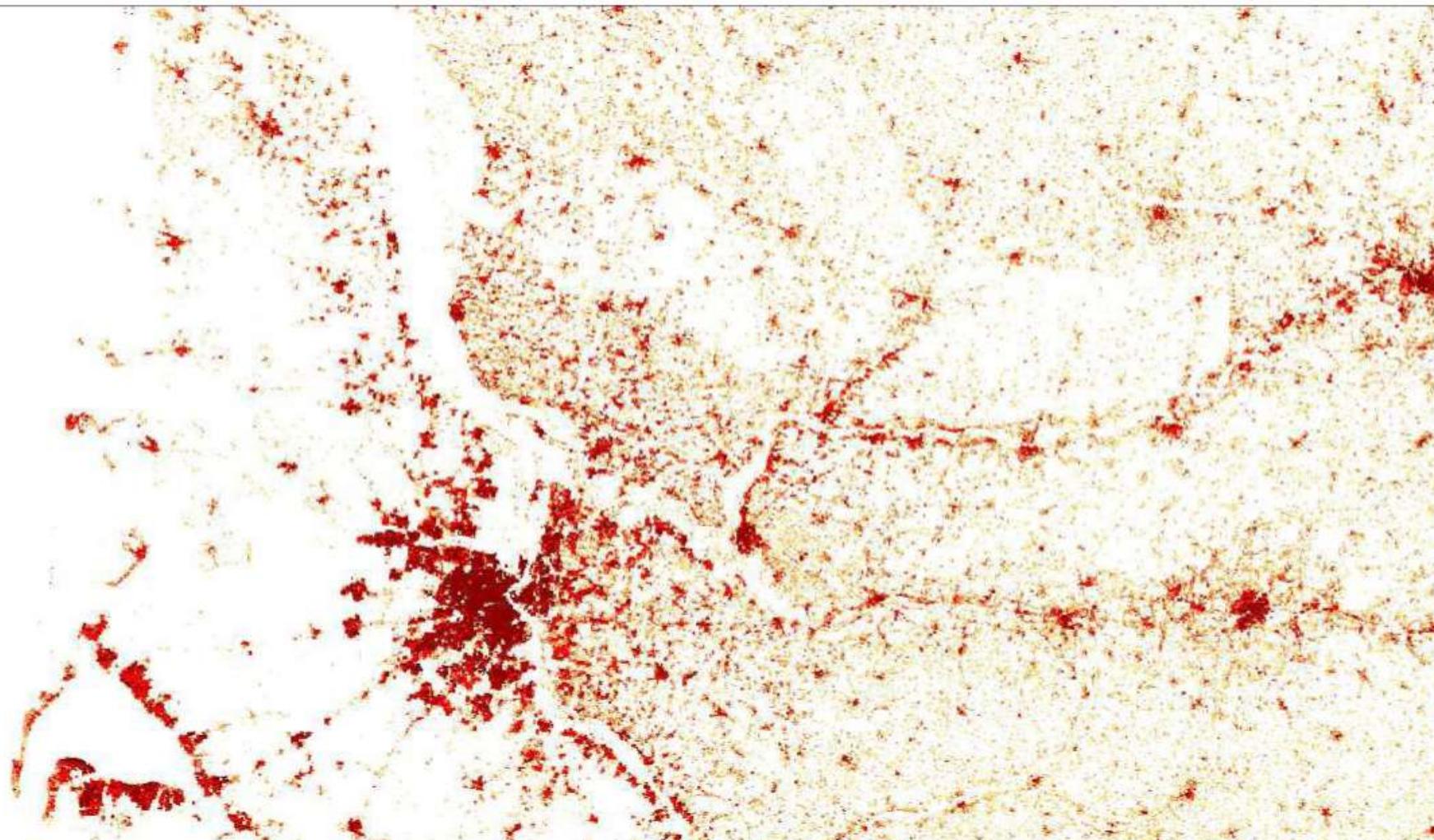
- No requirement to create new spatial data
 - No obligation to provide data for free
 - No minimum level of quality
 - No regulation of scales
-
- This is really problematic
 - Can end up in different data from one country to the next
 - Agreements between countries and through international organizations are needed – theme, categories, scale, quality, etc

Standardising geometry/resolution

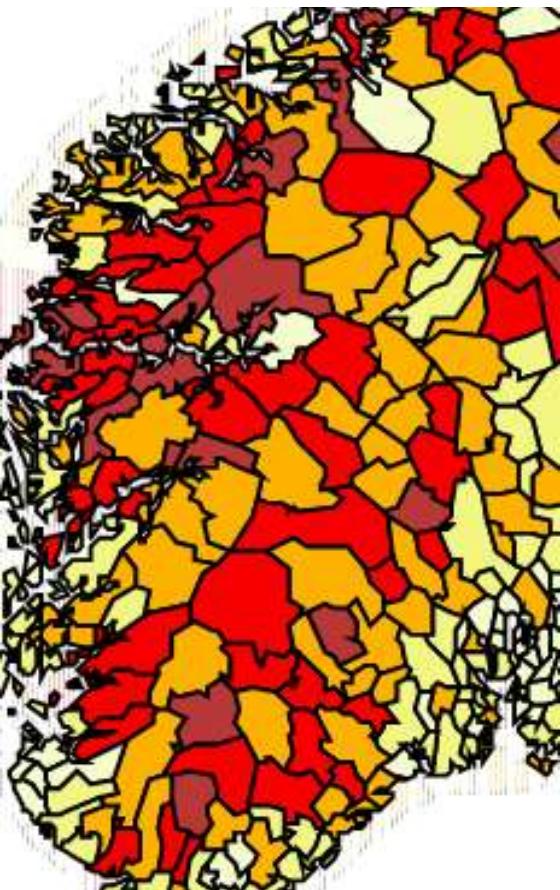
- Administrative unit
 - Country
 - Nuts 2 region
 - Nuts 3-5 municipality etc
 - Parish/Enumeration area
 - Other grouping
- Grid
 - standardised grid, 100, 250, 1000
- Theme specific distribution areas
- Registerbased to pointloc
 - Address
 - coordinate



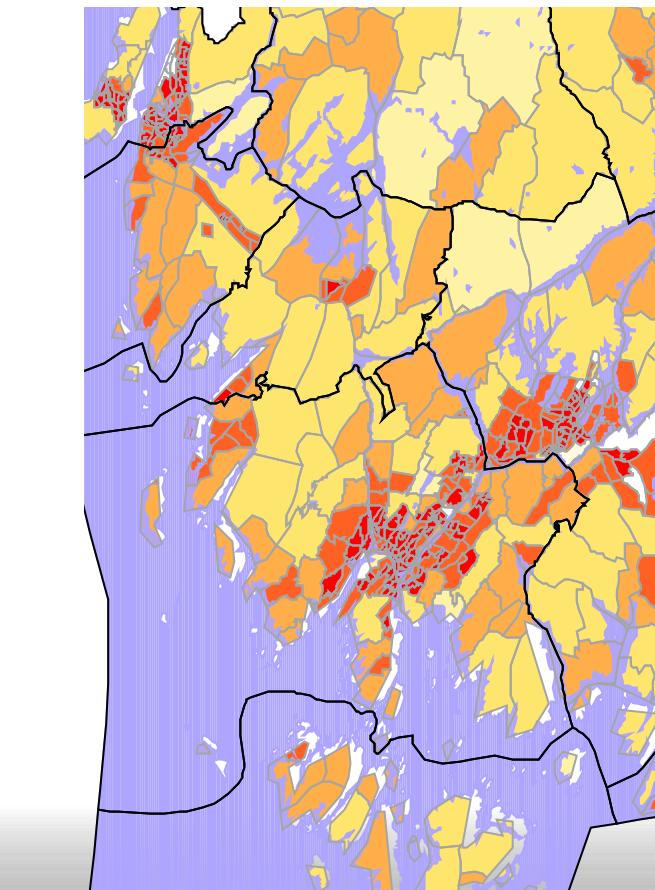
Population distribution grid cells



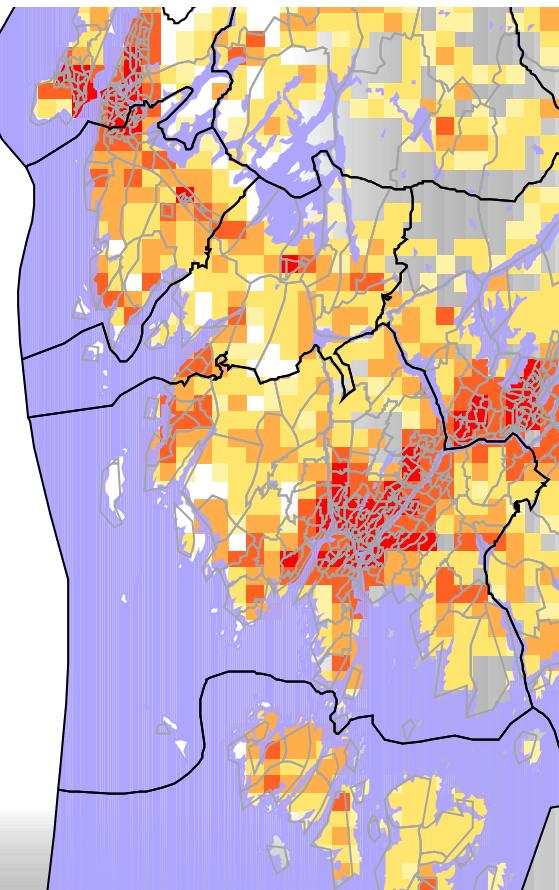
A country can choose – data on 1 municipal resolution, 2 parish 3 grid What does the other countries do?



1



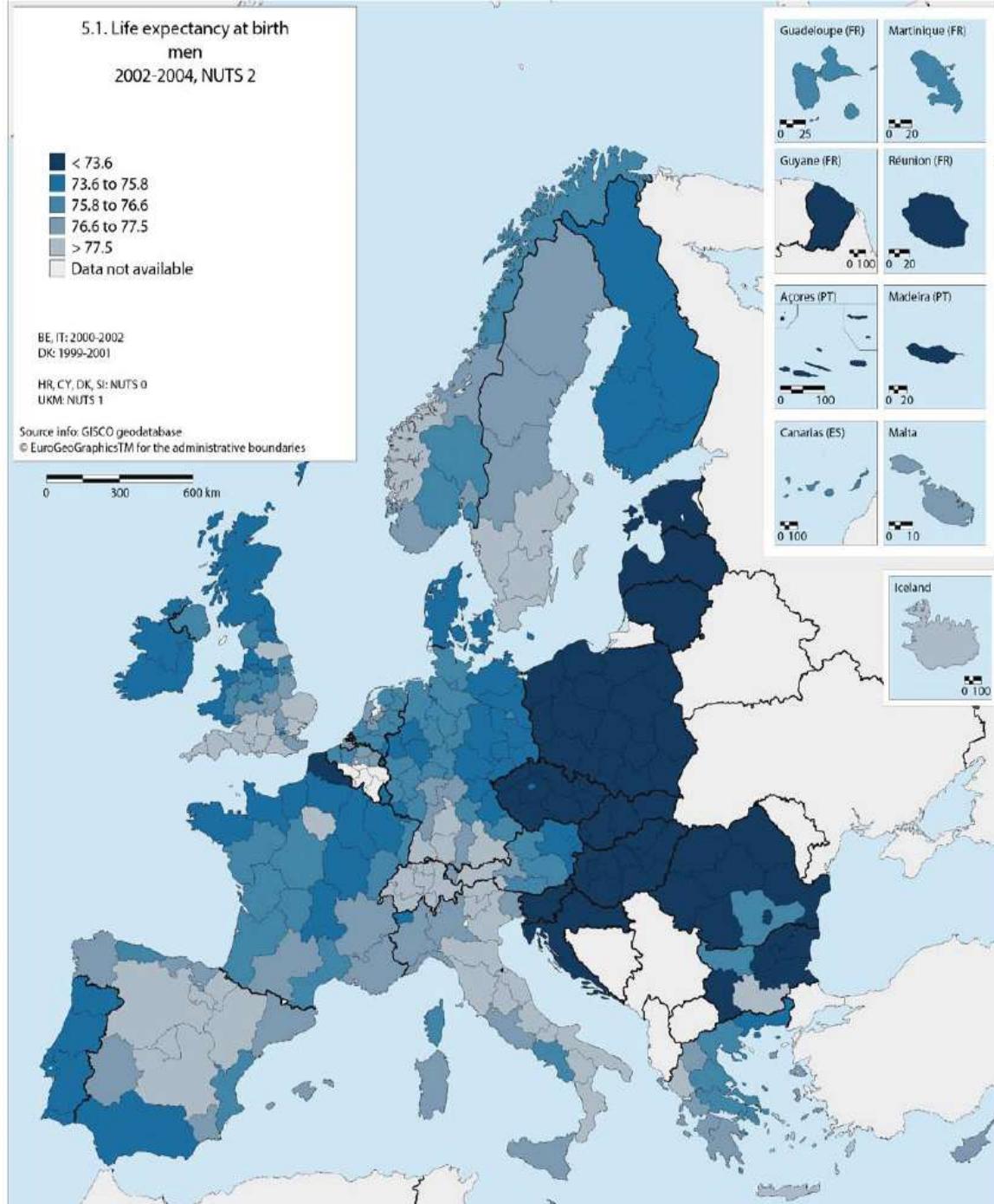
2



3

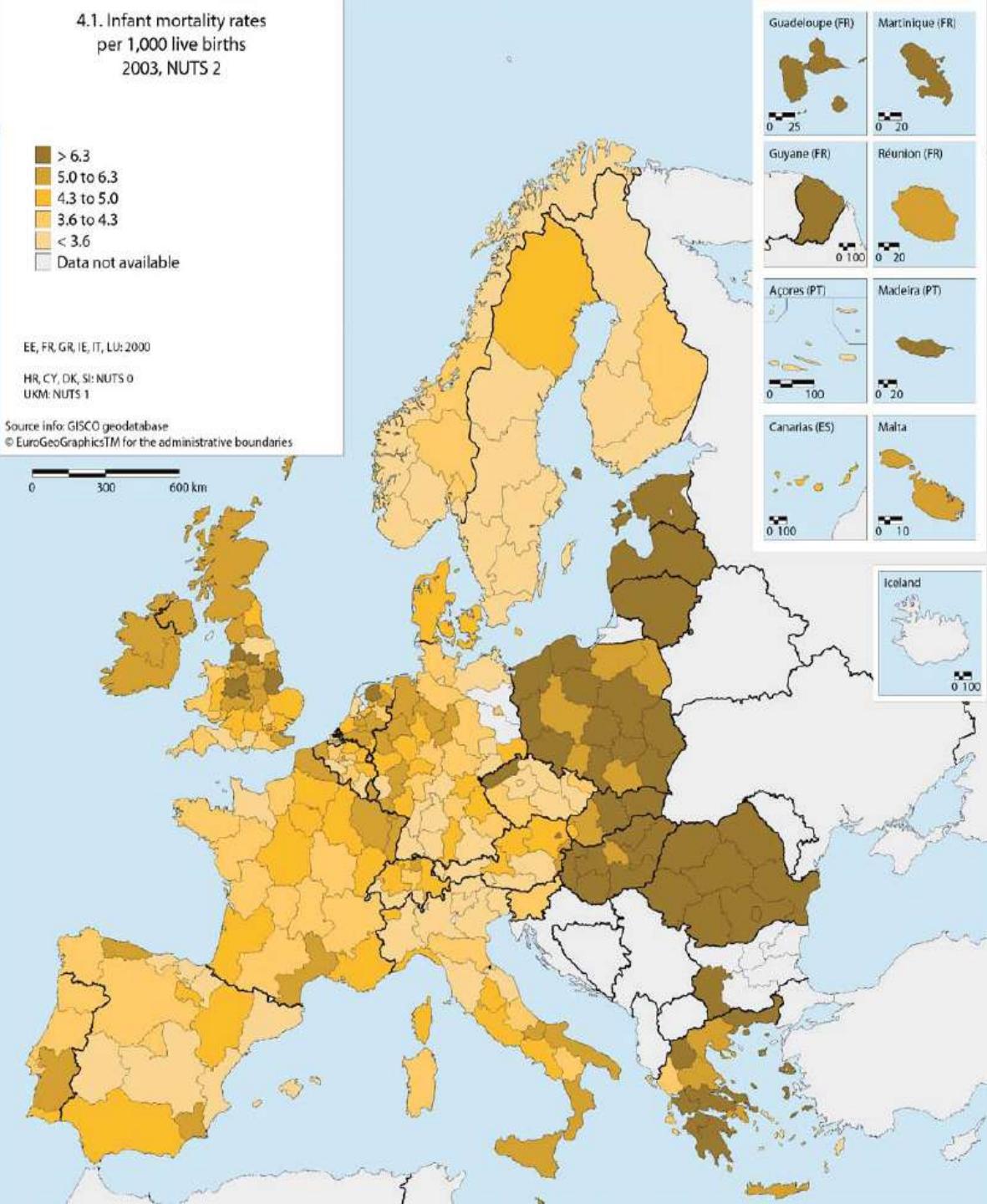
A country must identify -which of my data fits to the Inspire themes

Nuts 2
Life
expecancy



Nuts 2 Infant mortality

Example



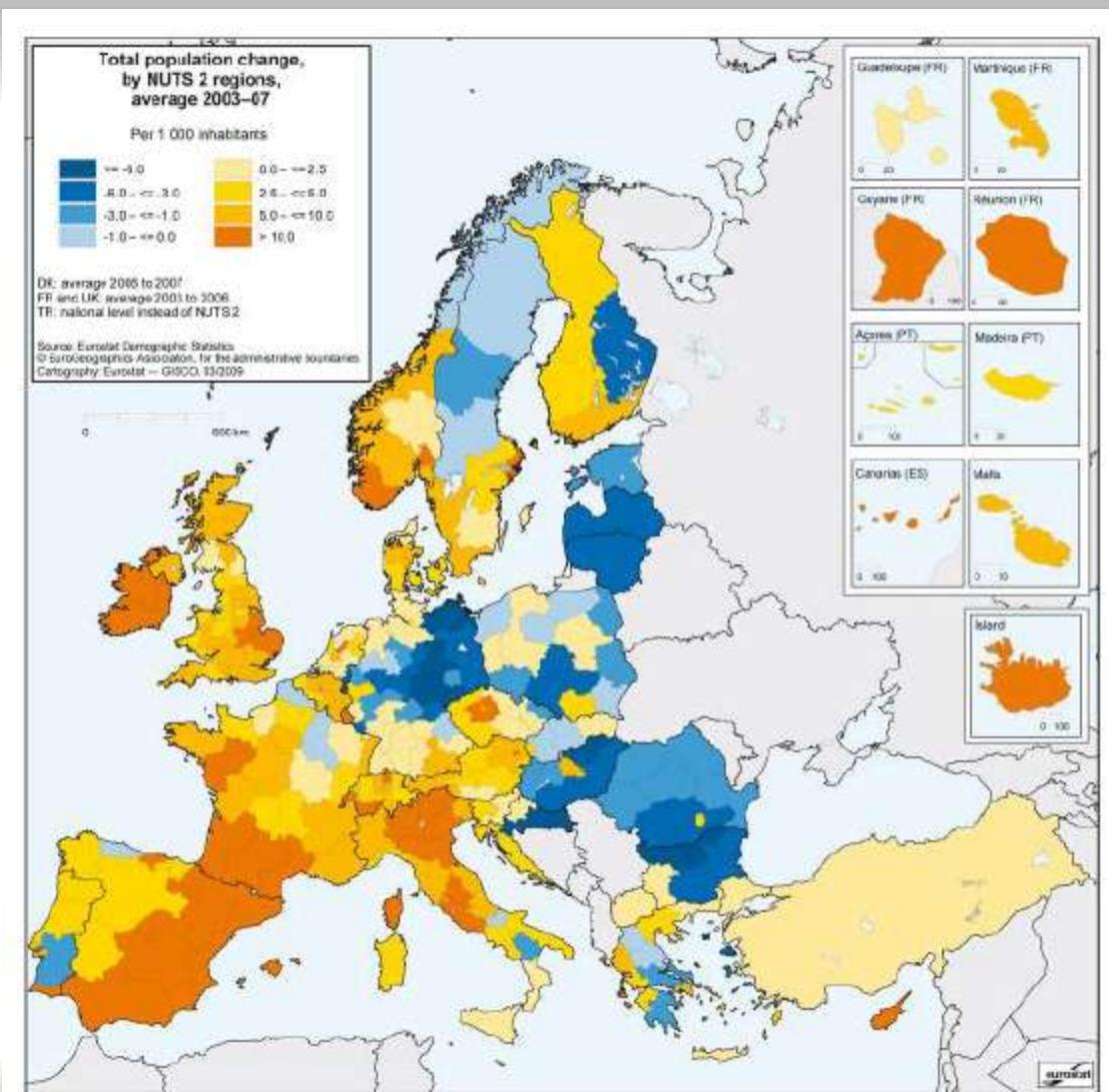


Figure 17 - Example of map using NUTS 2 regions.

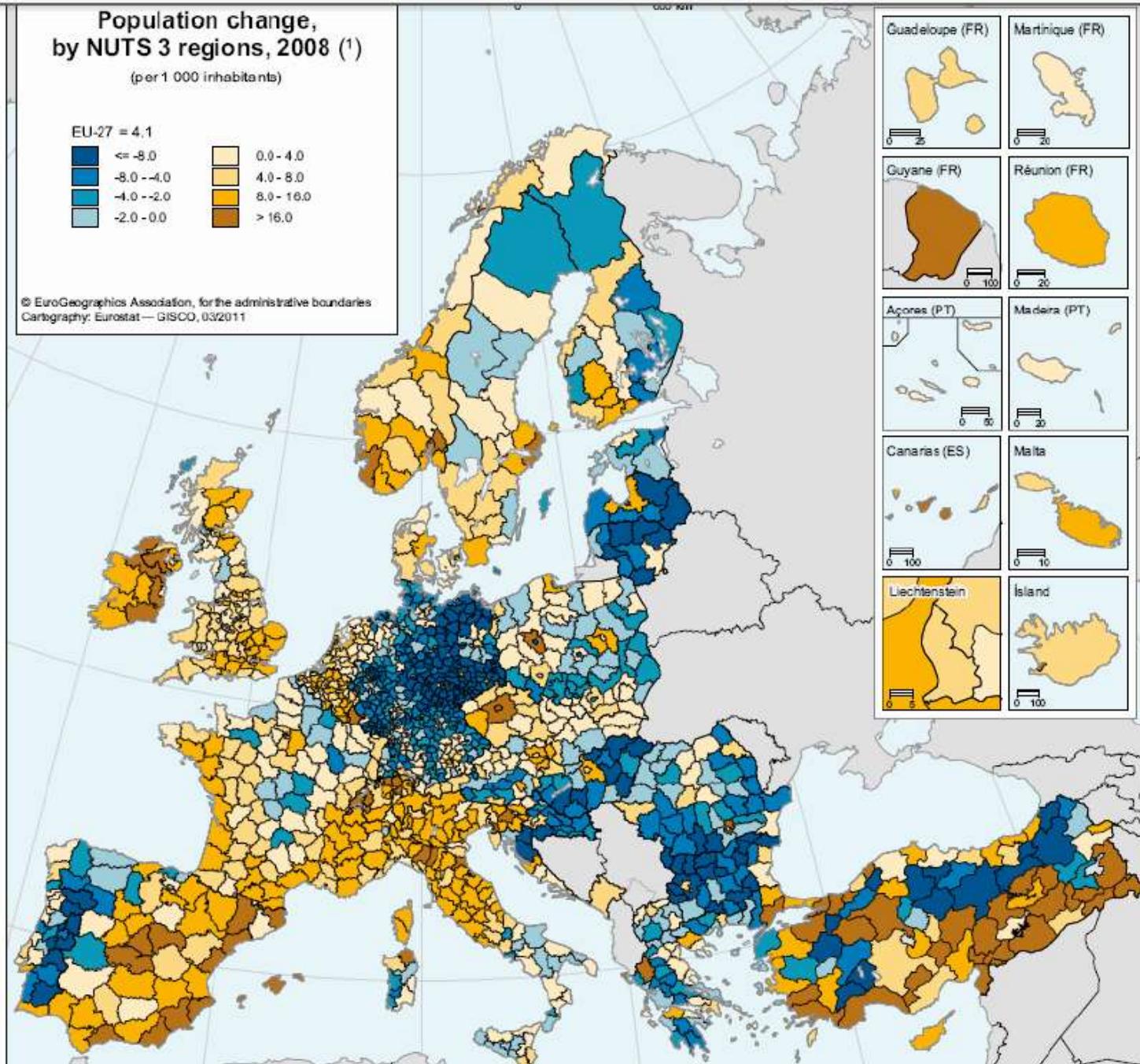
Population change, by NUTS 3 regions, 2008 (¹)

(per 1 000 inhabitants)

EU-27 = 4.1

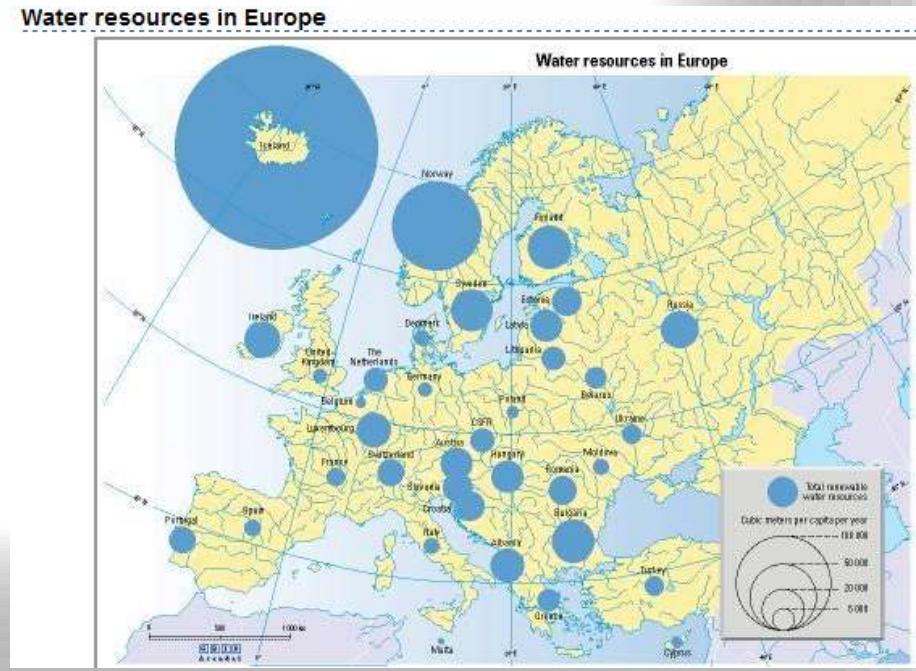
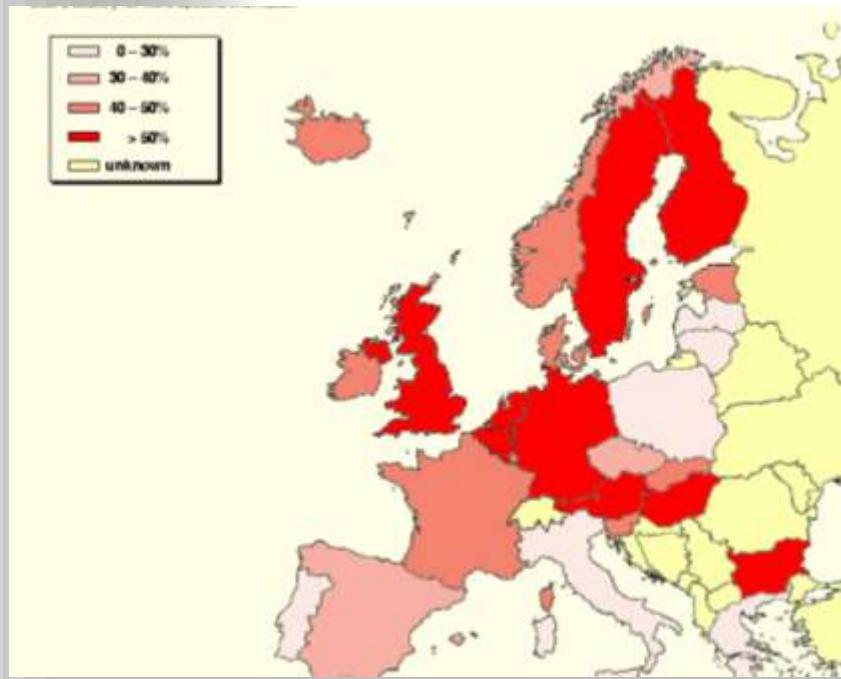
- ≤ -8.0
- 8.0 -- -4.0
- 4.0 -- -2.0
- 2.0 -- 0.0
- 0.0 -- 4.0
- 4.0 -- 8.0
- 8.0 -- 16.0
- > 16.0

© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat — GISCO, 03/2011



Statistics in many Inspire themes

- Pesticide residue in food - > HH
- Water resources in Europe - > Energy resources
- Statistical off



Health care

Health care: resources and patients (non-expenditure data) (reg_hlth_care)

Health personnel by region - Absolute numbers and rate per 100,000 inhabitants (hlth_rs_prsrg)

Hospital beds (HP.1) by region - Absolute numbers and rate per 100,000 inhabitants (hlth_rs_bdsrg)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, total number – Total (hlth_co_disch1t)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, total number – Males (hlth_co_disch1m)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, total number – Females (hlth_co_disch1f)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, per 100,000 inhabitants – Females (hlth_co_disch1f)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, per 100,000 inhabitants – Males (hlth_co_disch2f)

Hospital discharges by diagnosis (ISHMT) and region, in-patients, per 100,000 inhabitants – Total (hlth_co_disch2t)

In-patient average length of stay (ISHMT, in days) by region - Females (hlth_co_inpstf)

In-patient average length of stay (ISHMT, in days) by region - Males (hlth_co_inpstm)

In-patient average length of stay (ISHMT, in days) by region - Total (hlth_co_inpstt)

Hospital days of in-patients (ISHMT) by region - Females (hlth_co_hosdayf)

Hospital days of in-patients (ISHMT) by region - Males (hlth_co_hosdaym)

Hospital days of in-patients (ISHMT) by region - Total (hlth_co_hosdayt)

Hospital discharges by diagnosis (ISHMT) and region, day cases, total number – Females (hlth_co_disch3f)

Hospital discharges by diagnosis (ISHMT) and region, day cases, total number – Males (hlth_co_disch3m)

Hospital discharges by diagnosis (ISHMT) and region, day cases, total number – Total (hlth_co_disch3t)

Data linked to statistical units

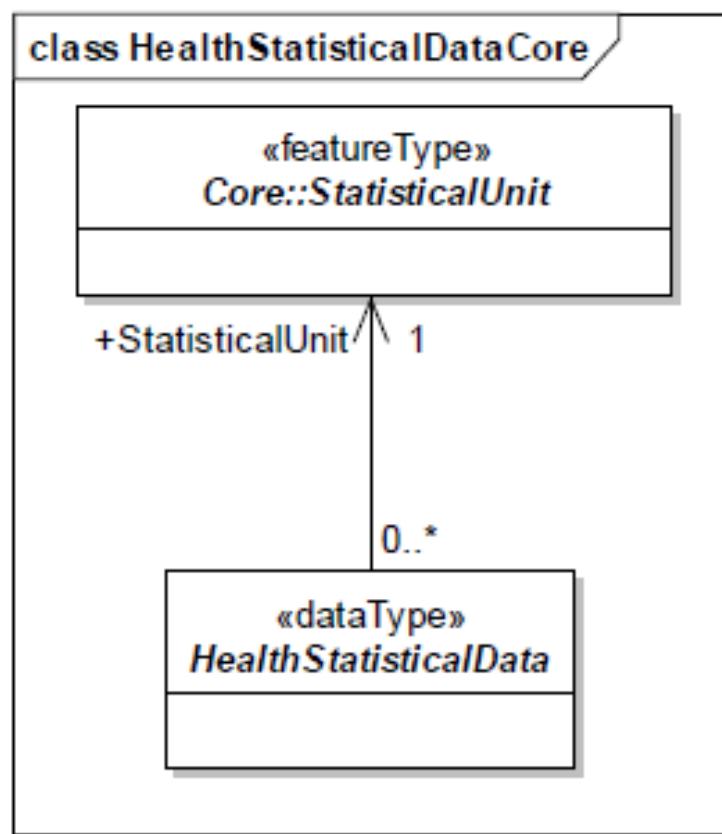
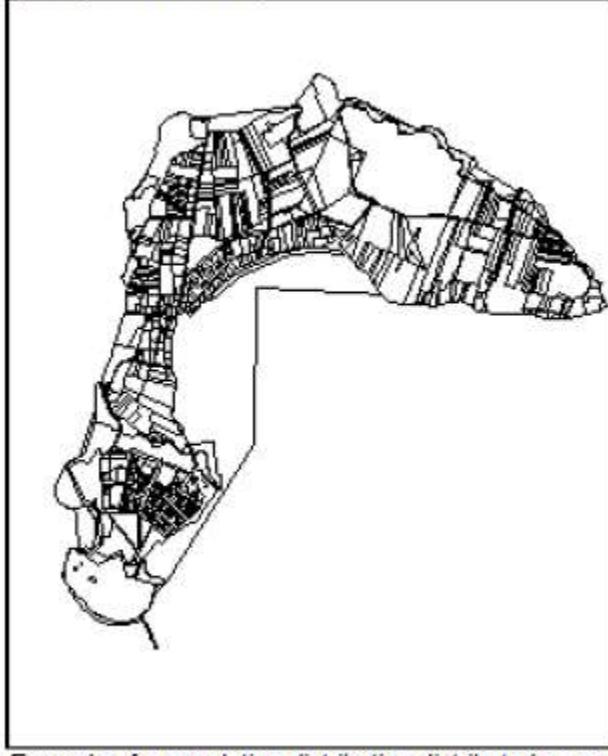


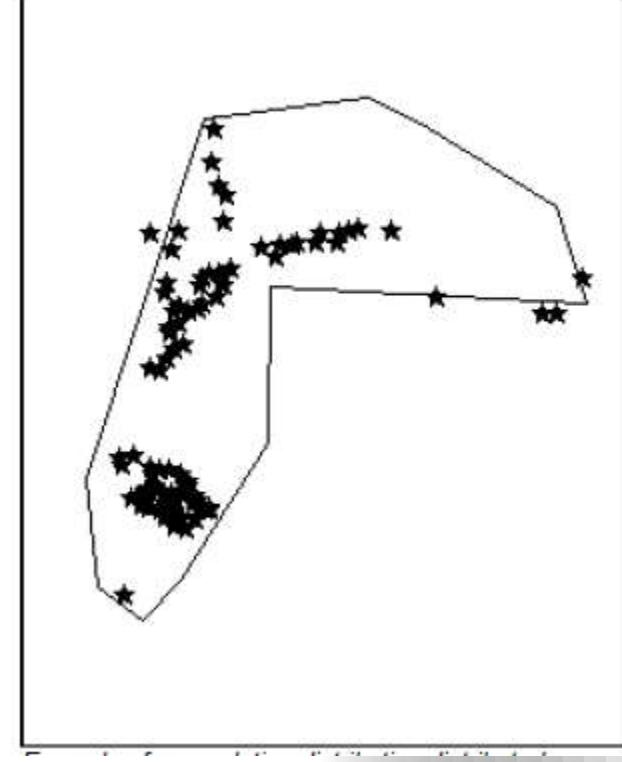
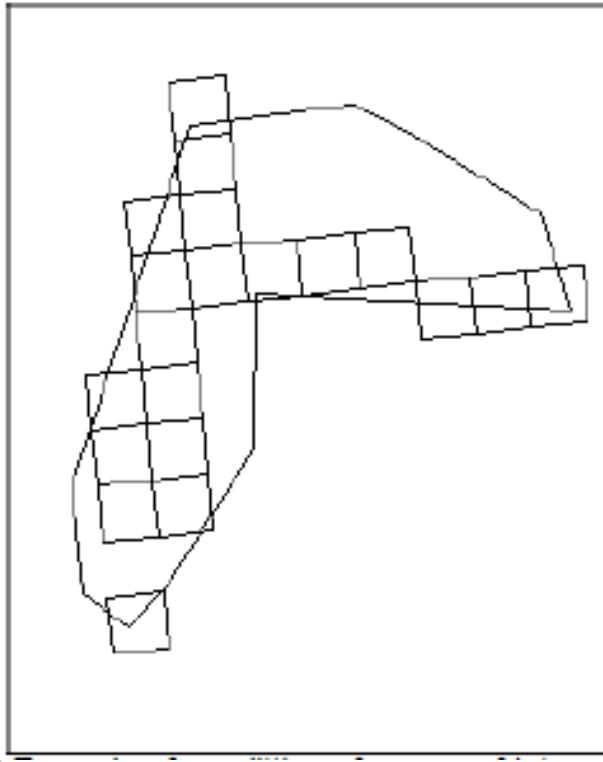
Figure 2 – UML class: `HealthStatisticalDataCore` diagram

Statistical units - geometry possibilities

quality section 7.1.



Example of a population distribution distributed on a net

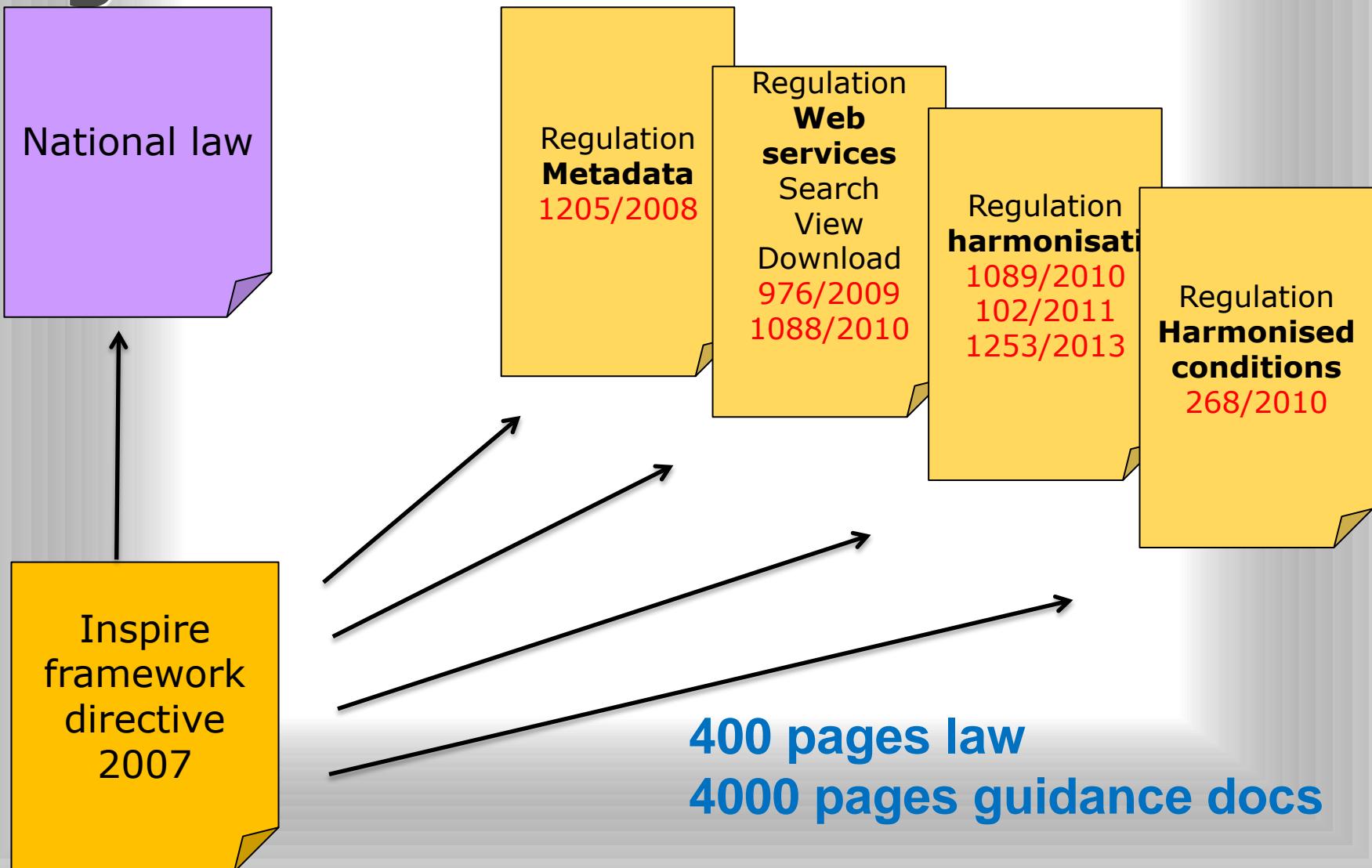


Periode for Measurement, for Reference, for validity ,
Rutenett på flere måter i flere annex'er, også her i stat-
unit/demography
Koordinat X, Y, EPSGkode, cellePosisjon, celleStørrelse, ikke krav
om LAEA

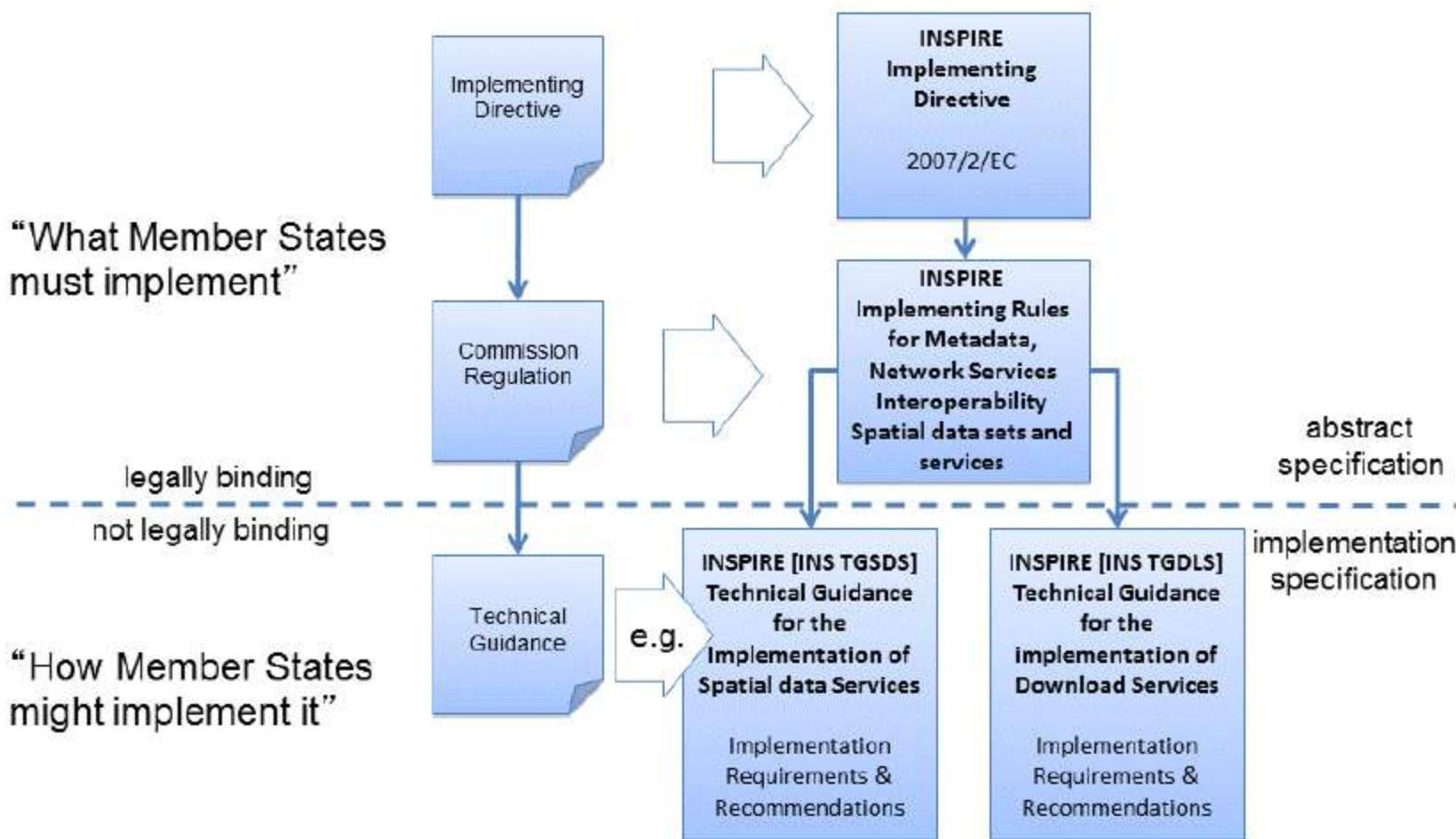


Inspire directive and docs

Inspire directive and regulations – 2007-2014

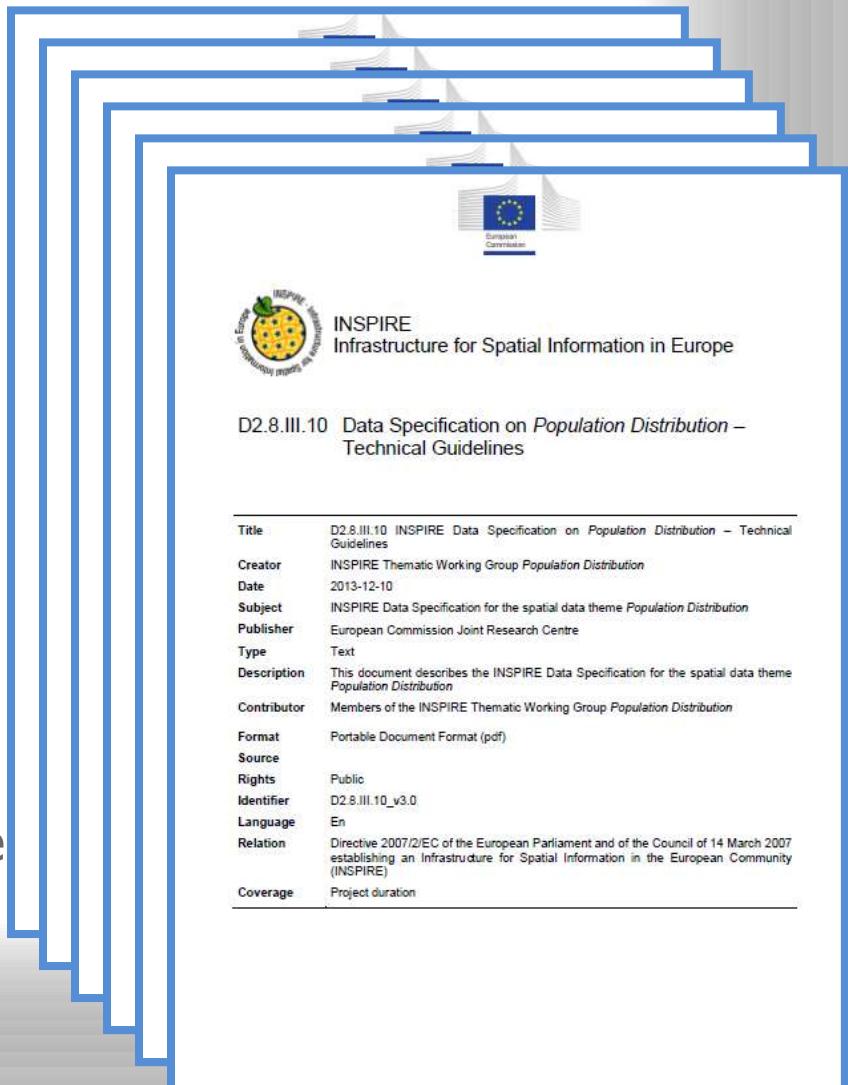


Relationship between INSPIRE Implementing Rules and Technical Guidance



Inspire data specifications

- Quick work
- Involvement of experts
- Define
 - Feature types
 - Attributes
 - Point to general specs, e.g. time, metadataQ
 - Point to other specs
 - (Portrayal)
 - Uml-models
 - They are used to prepare gml-schemas



The image shows a stack of five overlapping blue-bordered rectangles. Each rectangle contains a copy of the INSPIRE Data Specification on Population Distribution - Technical Guidelines document. The document features the European Commission logo at the top, followed by the INSPIRE Infrastructure for Spatial Information in Europe logo, which includes a stylized yellow fruit. Below these are the title "D2.8.III.10 Data Specification on Population Distribution – Technical Guidelines", a table of contents, and detailed technical specifications.

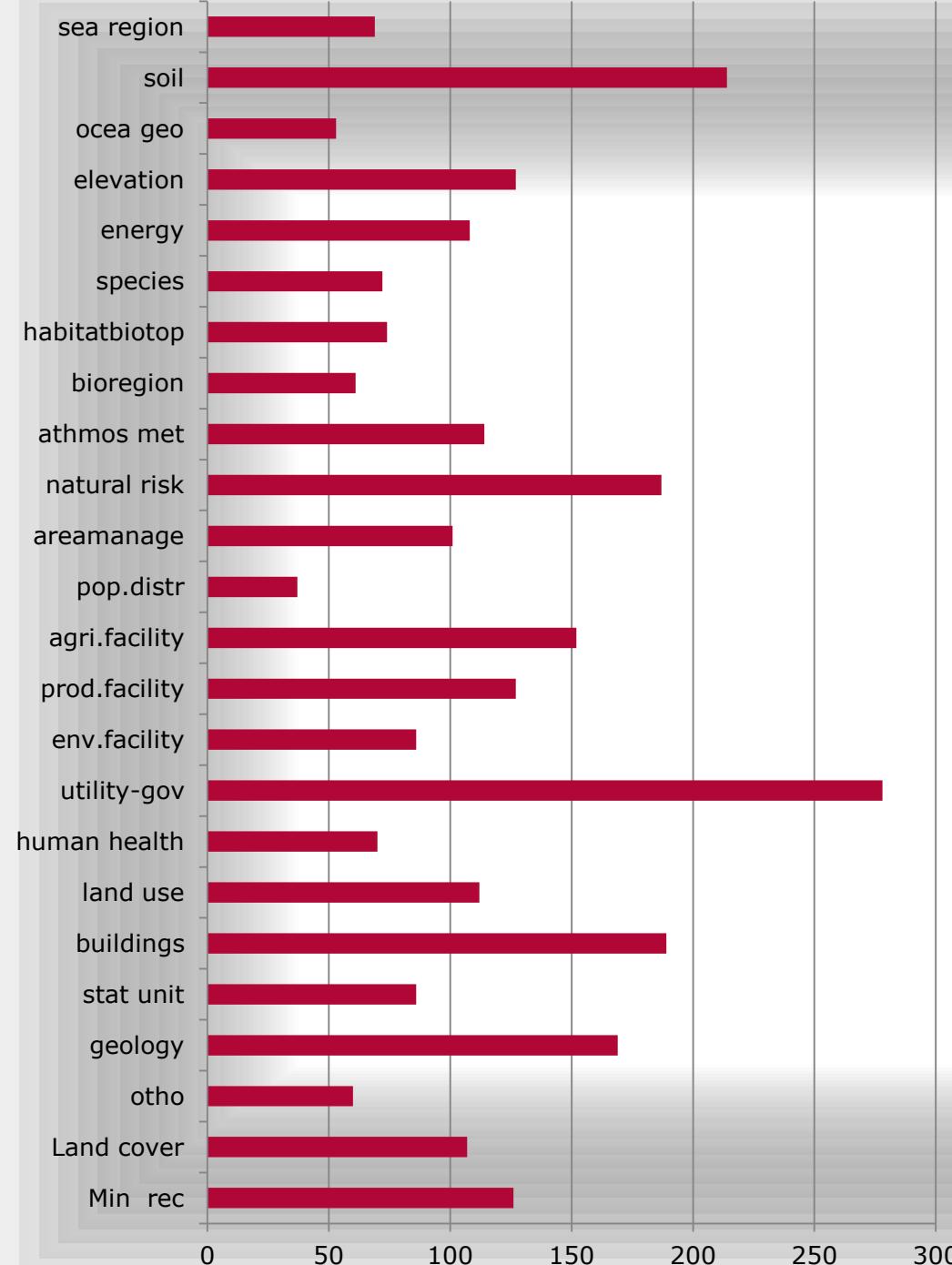
D2.8.III.10 Data Specification on Population Distribution – Technical Guidelines

Title	D2.8.III.10 INSPIRE Data Specification on Population Distribution – Technical Guidelines
Creator	INSPIRE Thematic Working Group Population Distribution
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme Population Distribution
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme Population Distribution
Contributor	Members of the INSPIRE Thematic Working Group Population Distribution
Format	Portable Document Format (pdf)
Source	
Rights	Public
Identifier	D2.8.III.10_v3.0
Language	En
Relation	Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)
Coverage	Project duration

Spec Docs volume

- Lots of pages
- Technical and detailed
- 2779 sider
- Utility " in the lead !

Serie1





Inspire themes and deliverables

Inspire themes and deliverables

Annex 1

- coordinate reference systems
- geographical grid syst.
- geographical names
- administrative units
- addresses
- transport networks
- cadastral parcels
- hydrography
- protected sites

Annex 3 data:

- ◆ Statistical units
- ◆ Buildings
- ◆ Soils
- ◆ Land use
- ◆ Human health and safety
- ◆ Utility and government services
- ◆ Environm. monitoring facilities
- ◆ Production and industrial facilities
- ◆ Agriculture and aquaculture facilities
- ◆ Population distribution - demography
- ◆ Area management/restriction/regulation zone and reporting units
- ◆ Natural risk zones
- ◆ Atmospheric conditions
- ◆ Meteorological geographical features
- ◆ Oceanographic geographical features
- ◆ Sea regions
- ◆ Bio-geographical regions
- ◆ Habitats and biotops
- ◆ Species distribution
- ◆ Energy resources
- ◆ Mineral resources

Annex 2 data:

- ◆ elevation
- ◆ land cover
- ◆ orthoimagery
- ◆ geology

4000 pages
Inspire data specs

Omkoding - en til en eller?

4.3.1.3. Maritime Zone

A belt of sea defined by jurisdictional rights.

Attributes of the spatial

Attribute	Value
inspireId	E S
geometry	C S n
zoneType	I
country	D Z
name	T N
beginLifeSpanVersion	I V i
endLifeSpanVersion	I S i

Values for the code list MaritimeZoneTypeValue

Value	Name	Definition
internalWaters	Internal Waters	The waters on the landward side of the baselines of the territorial sea of the coastal State.
territorialSea	Territorial Sea	A belt of sea of a defined breadth not exceeding 12 nautical miles determined in accordance with Article 12 of the United Nations Convention of Law of the Sea.
contiguousZone	Contiguous Zone	A zone contiguous with the territorial sea of a coastal State, which may extend up to 12 nautical miles from the baseline of the territorial sea in accordance with Article 17 of the United Nations Convention of Law of the Sea.
exclusiveEconomicZone	Exclusive Economic Zone	An area beyond and adjacent to the territorial sea of a coastal State, such that under international law the rights and duties of the State and the right to exploit natural resources are governed by the United Nations Convention on the Law of the Sea.
continentalShelf	Continental Shelf	A maritime zone beyond and adjacent to the territorial sea of a coastal State whose outer boundary is determined in accordance with Article 76 of the United Nations Convention on the Law of the Sea.



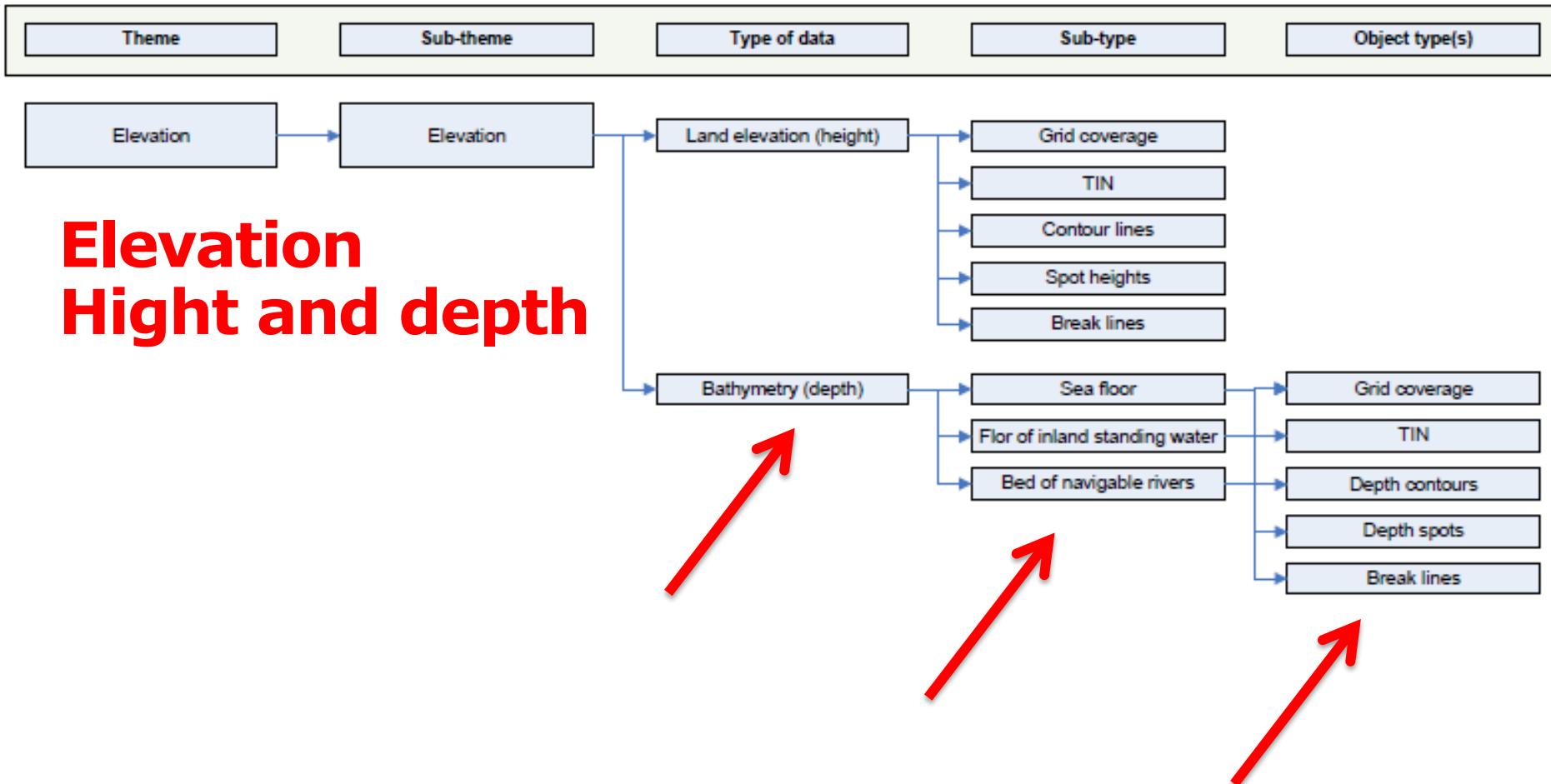
Figur 1: Norsk avstrekning av grunnlaget og grensene til de forskjellige maritime zone i det norske havområdet.

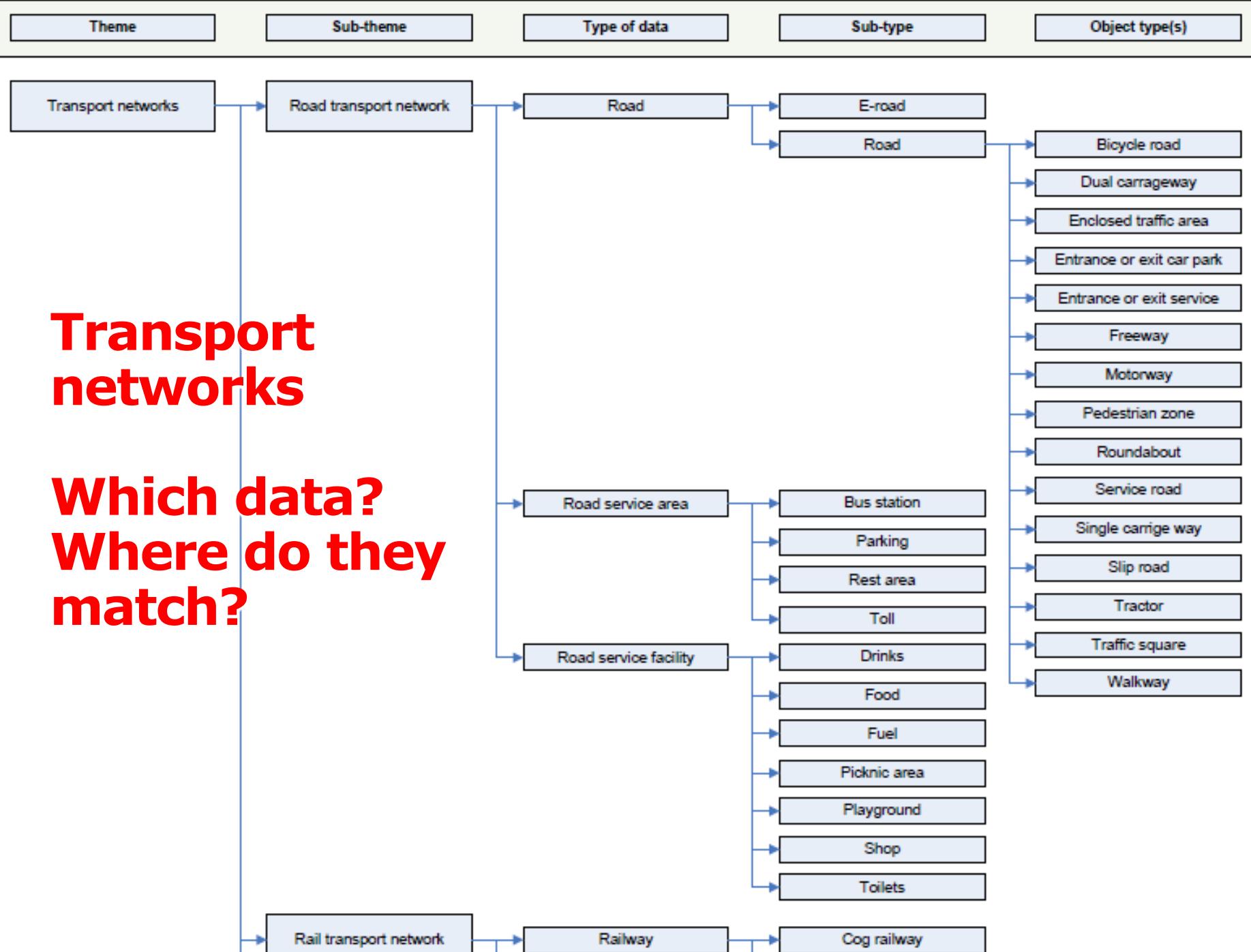


- INSPIRE vedlegg I**
 - Koordinatbasert referansesystem
 - Geografiske rutenettssystemer
 - Stedsnavn
 - Administrative enheter
 - Adresser
 - Eiendomsteiger
 - Transportnett
 - Hydrografi
 - Vernde områder
- INSPIRE vedlegg II**
 - Høyde
 - Arealdekke
 - Ortofoto
 - Geologi
- INSPIRE vedlegg III**
 - Statistiske enheter
 - Bygninger
 - Jordarter
 - Areal bruk
 - Menneskers helse og sikkerhet
 - Allmennytige og offentlige tjenester
 - Anlegg for miljøovervåking
 - Produktions- og industrianelegg
 - Anlegg for landbruk og akvakultur
 - Befolkningsfordeling - demografi
 - Områder med særskilt forvaltning, restriksjoner eller regulering samt rapporteringsenheter
 - Områder med naturbetingede farer
 - Atmosfæriske forhold
 - Meteorologisk-geografiske forhold
 - Oseanografiske geografiske forhold
 - Havområder
 - Biogeografiske områder
 - Habitatet og biotoper
 - Artsfordeling
 - Energiressurser
 - Mineralressurser

Hjem identifiserer tilhørende Inspire obj?
Skal det settes opp fellesbaser/tjenester?
Hjem setter opp fellesbaser/tjenester?

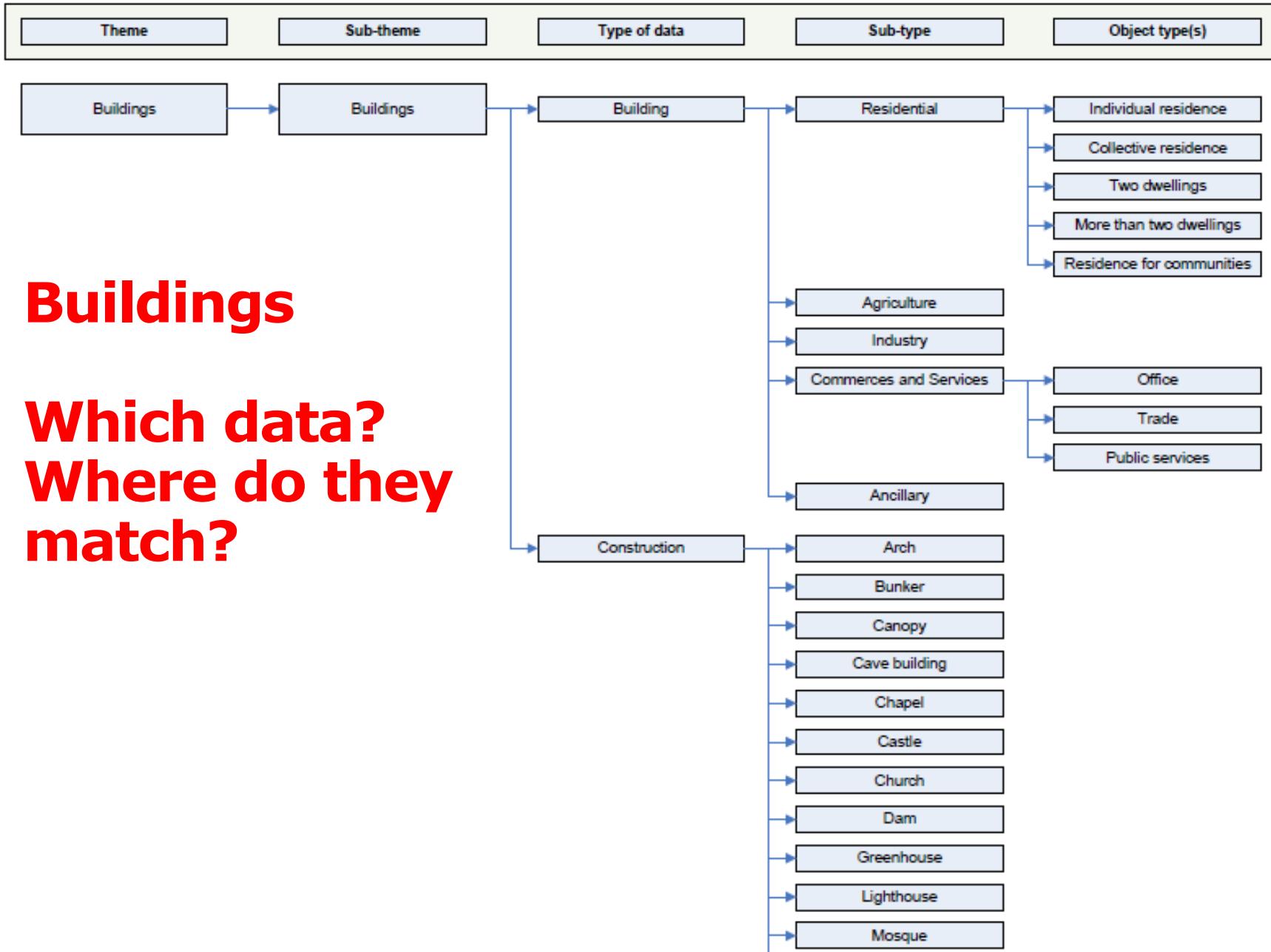
National data and Inspire/European data model – simplified overviews – identification of each nations own data

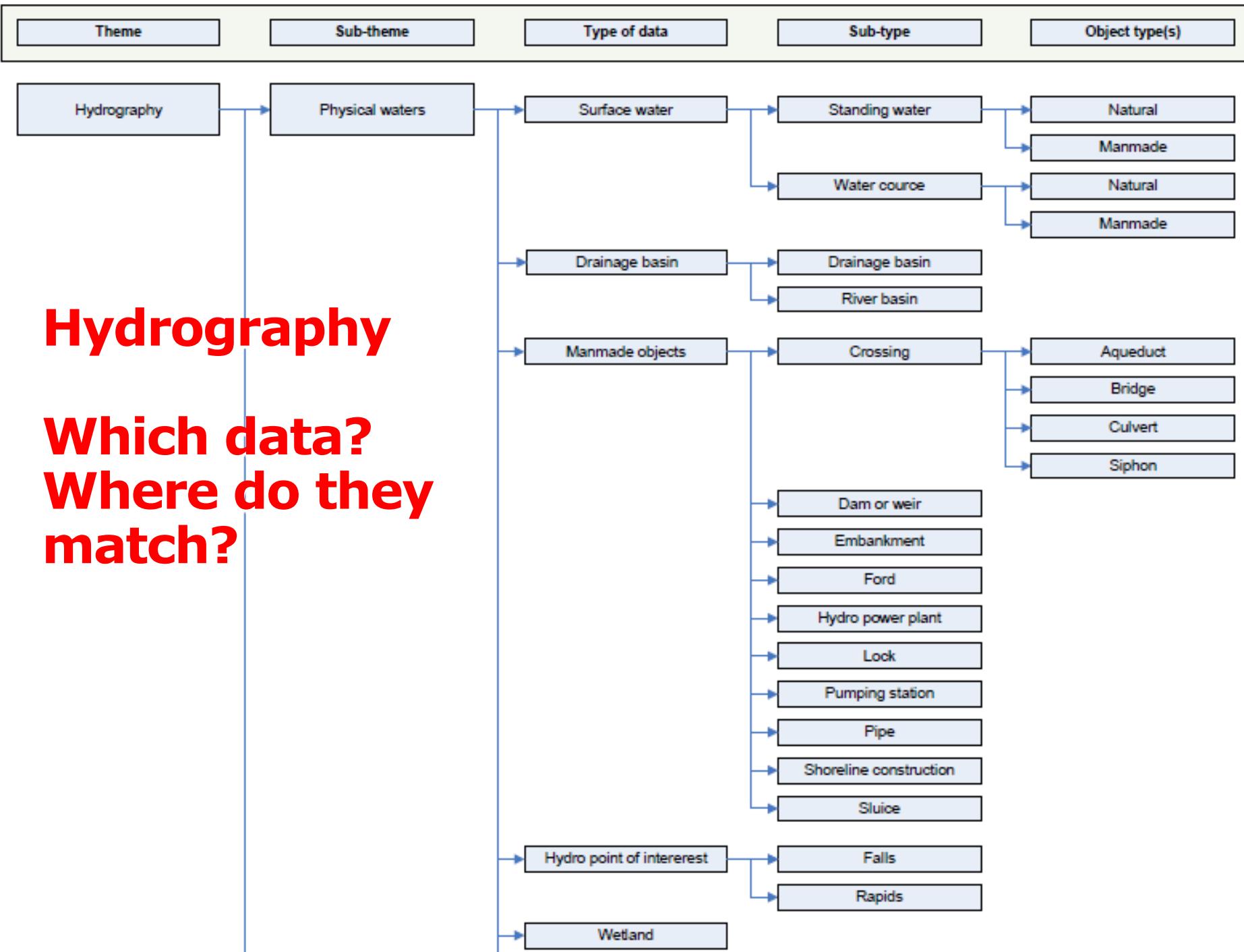


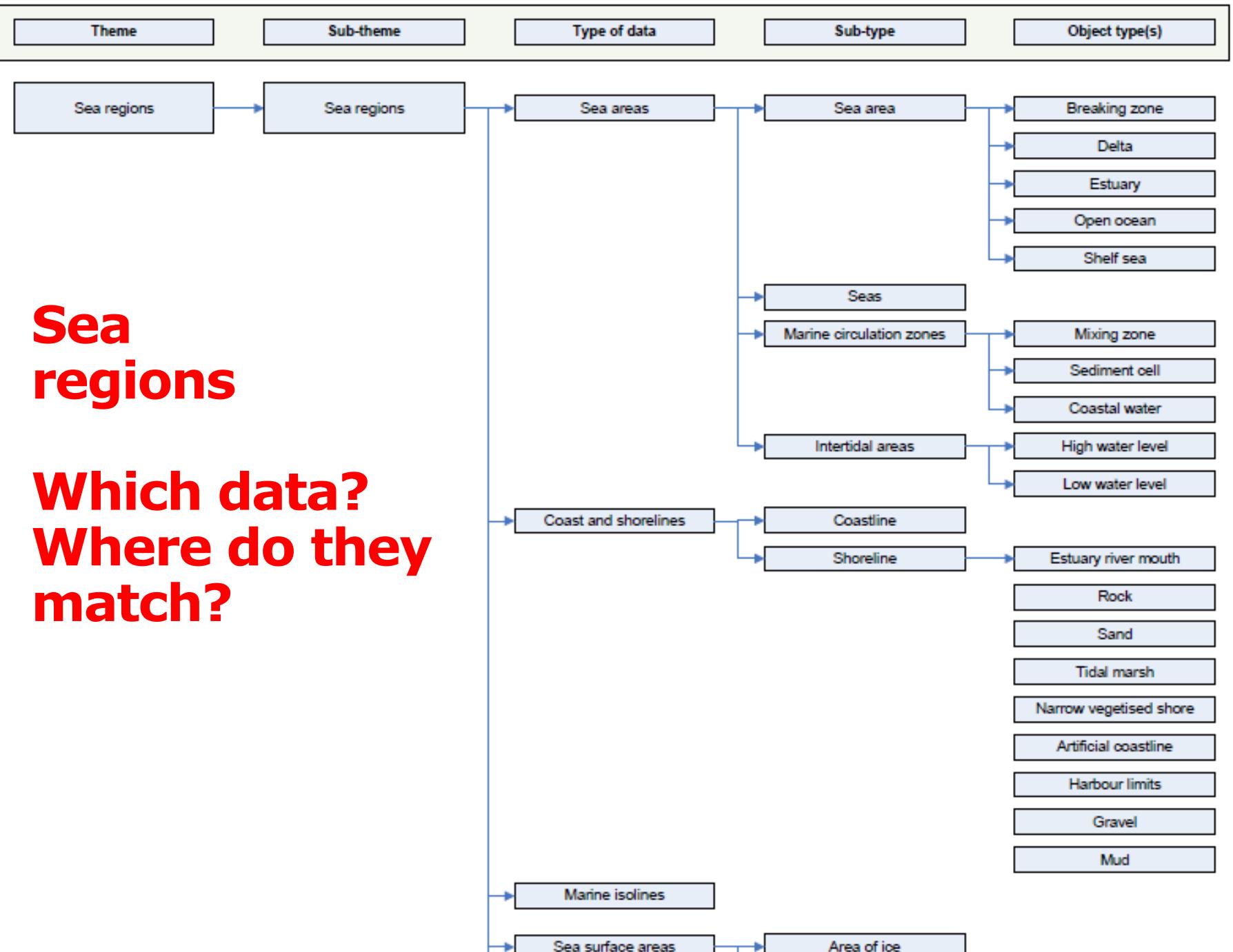


Transport networks

Which data?
Where do they match?







Sea regions

**Which data?
Where do they
match?**

Delivery requirements

- Metadata
 - For data and services
- Product specifications
 - National specifications
 - Mapping rule to Inspire data models
- File download
 - Ready made files or
 - Export on the fly- atom feed
- WMS
 - national content
 - Inspire content
- WFS/ WCS/SOS/TJS
 - National content
 - Inspire content





Inspire metadata

Product specifications and metadata - both data about data

Product specifications

**Normative
specifications about
how data should be**

Metadata

**Descriptive
documentation about
how data are**



Different roles - different use

Different kinds of metadata

- Search metadata
- Use metadata
- used in portals/ serach engines
- separte files
- integrated in gi datasets in a separate section
- integrated as attributes on each object
- different levels of metadata
- which metadata to be posted/delivered where?

Search metadata info about datasets and services

- name and version
- description of content
- description of potential uses
- history of data and methodology
- link to web page with the datasett/ service
- example picture of a map/service
- updating frequency
- coverage
- defined in feature catalogue/ product spec
- quality issues, geometry, topology, thematic accuracy
- presentation rules
- distribution information
- restrictions in use

Use metadata

- detailed metadata to make you understand
 - Quality
 - location accuracy
 - thematic accuracy,
 - validation results against a product specification,
 - Source and Mapping methodology
 - Specific for population distribution:

Domain	"demography"
Measure	"populationAtResidencePlace"
Classifications	"gender"
measurementUnit	"person"
areaOfDissemination	"surroundings of Bordeaux"

Metadata - delivery format: xml, ISO 19115 content- 19139-structure

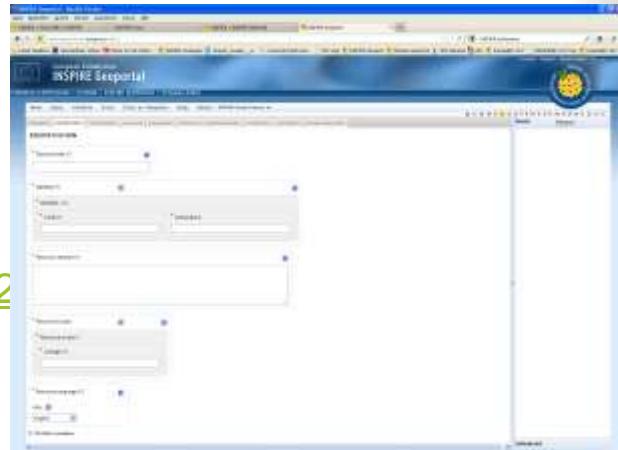
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- <gmd:MD_Metadata xsi:schemaLocation="http://www.isotc211.org/2005/gmd http://www.isotc211.org/2005/gmd/gmd.xsd http://www.isotc211.org/2005/srv
http://schemas.opengis.net/iso/19139/20060504/srv/srv.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:geonet="http://www.fao.org/geon
xmlns:gmd="http://www.isotc211.org/2005/gmd">
  - <gmd:fileIdentifier>
    <gco:CharacterString xmlns:gco="http://www.isotc211.org/2005/gco">041f1e6e-bdbc-4091-b48f-8a5990f3cc5b</gco:CharacterString>
  </gmd:fileIdentifier>
  - <gmd:language>
    <gco:CharacterString xmlns:gco="http://www.isotc211.org/2005/gco">nor</gco:CharacterString>
  </gmd:language>
  - <gmd:hierarchyLevel>
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ML_Codelist.xml#MD_ScopeCode">dataset</gmd:MD_ScopeCode>
  </gmd:hierarchyLevel>
  - <gmd:contact>
    - <gmd:CI_ResponsibleParty>
      - <gmd:individualName>
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      </gmd:individualName>
      - <gmd:organisationName>
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      </gmd:organisationName>
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            </gmd:CI_Telephone>
          </gmd:phone>
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            - <gmd:CI_Address>
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              </gmd:electronicMailAddress>
            </gmd:CI_Address>
          </gmd:address>
        </gmd:CI_Contact>
      </gmd:contactInfo>
      - <gmd:role>
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Metadata your data?

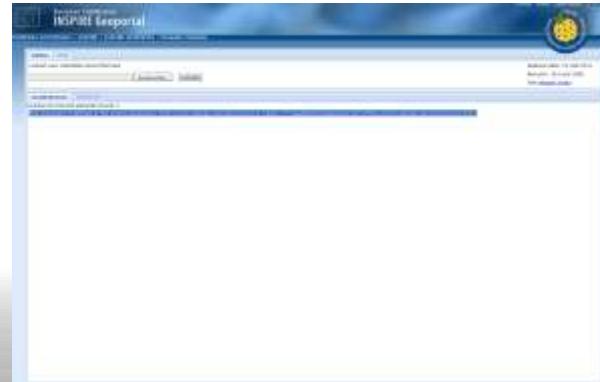
- Metadata editor

<http://inspire-geoportal.ec.europa.eu/editor/>

<https://editor.geonorge.no/Metadata/Edit?uuid=2fd5d9bb>



- Metadata validator
- <http://inspire-geoportal.ec.europa.eu/validator/>
 - Metadatavalidatoren <http://validering.geonorge.no/>





Inspire specs and data models

statistica units

Statistical units

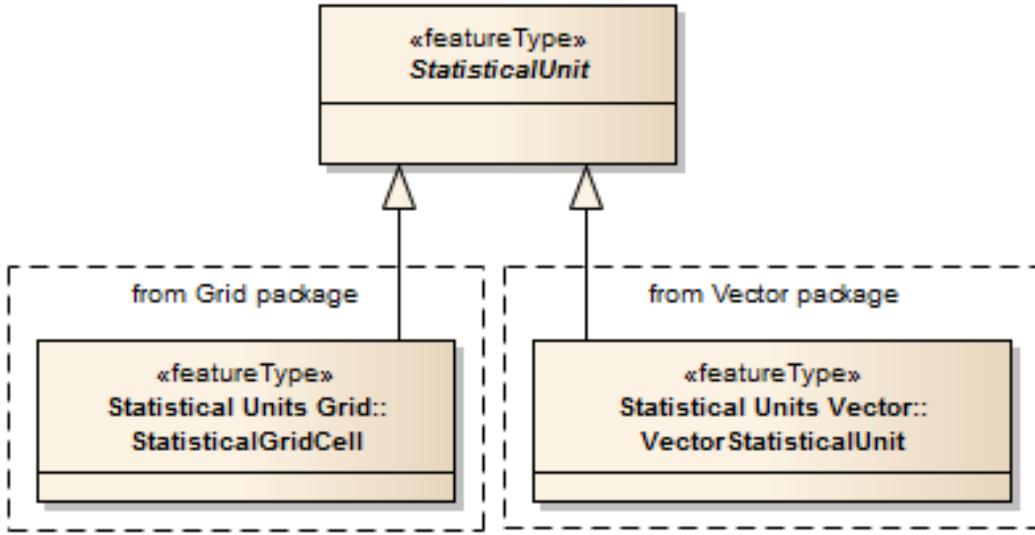
Definition and description

Definition

Units for dissemination or use of statistical information.

Description

Statistical unit informs on the location of statistical data and information. The principle of this theme is to provide stable and identified representations of the statistical units – and statistical data refers to these objects through their identifier. Recommendations are provided on how to give stable identifiers to statistical unit and use these identifiers to attach statistical information on them. This is particularly important if the responsibility for geometry and statistical data are shared between different institutions e.g. mapping agency and statistical offices. Other INSPIRE data specifications such as Population Distribution use this referencing mechanism.



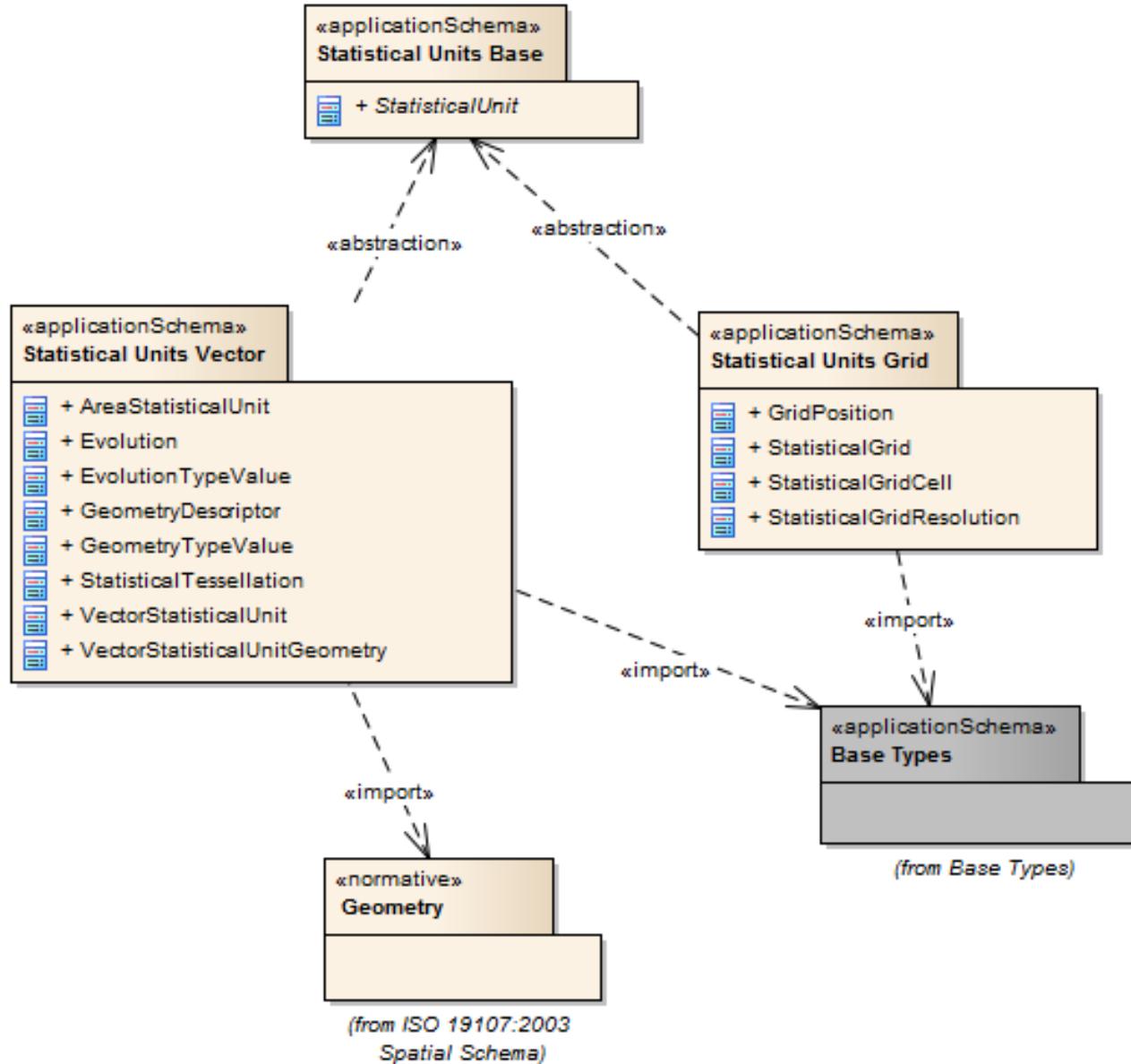
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Modified: 10/5/2012 9:55:46 AM

[+ Project:](#)

[+ Advanced:](#)



StatisticalUnits : Package diagram



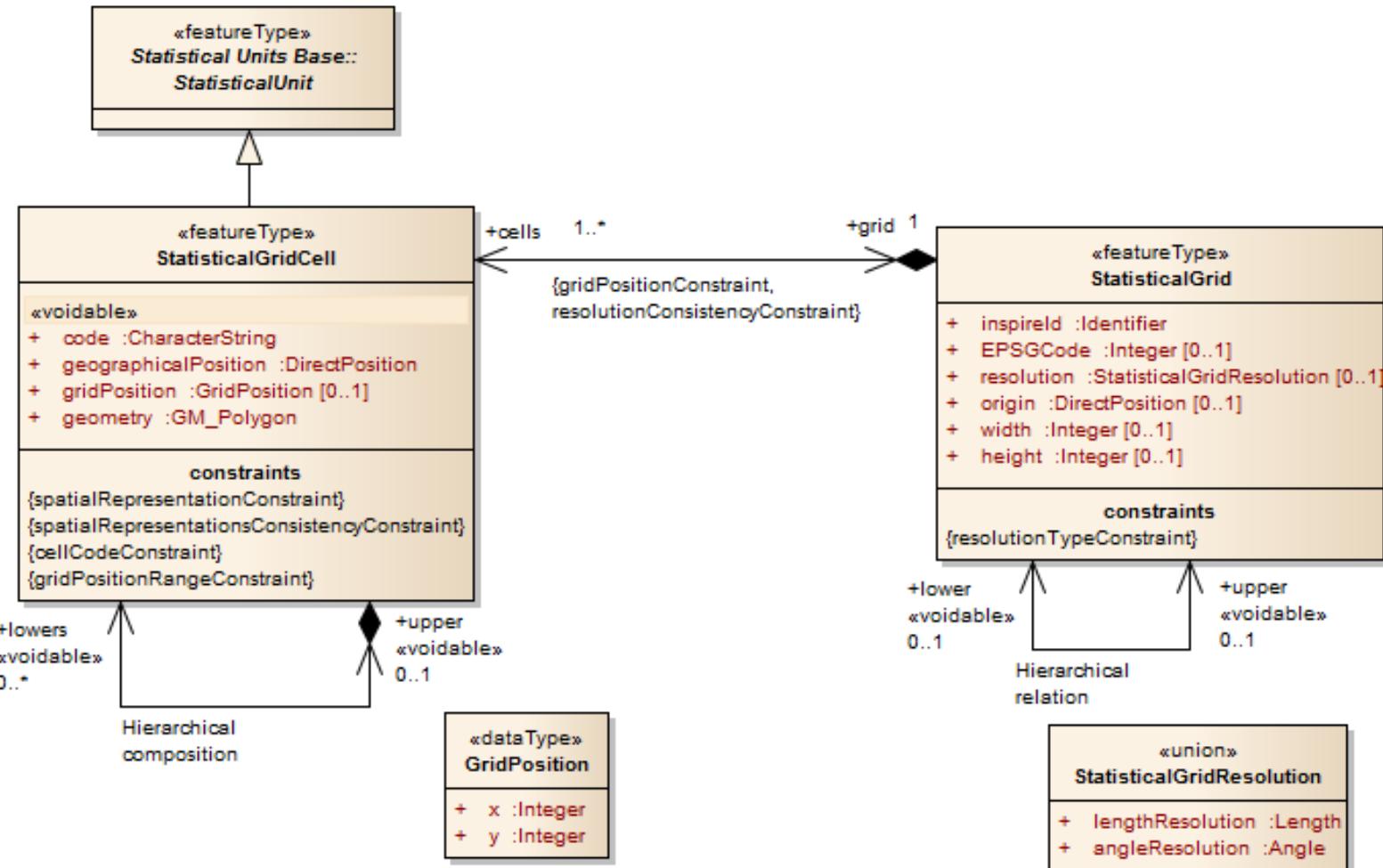
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9/7/2010 10:35:50 AM

Modified:

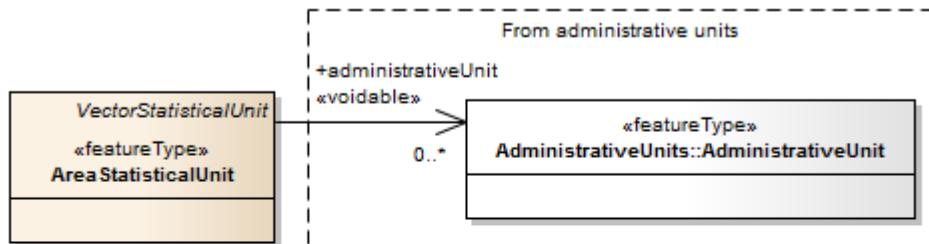
3/15/2012 3:10:32 PM



Grid : Class diagram

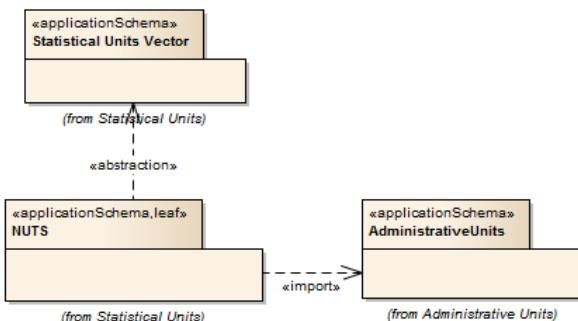
Created: 9/7/2010 10:32:31 AM
 Modified: 12/3/2012 11:50:10 AM
 Project:
 Advanced:

Vector statistical unit -> administrative units



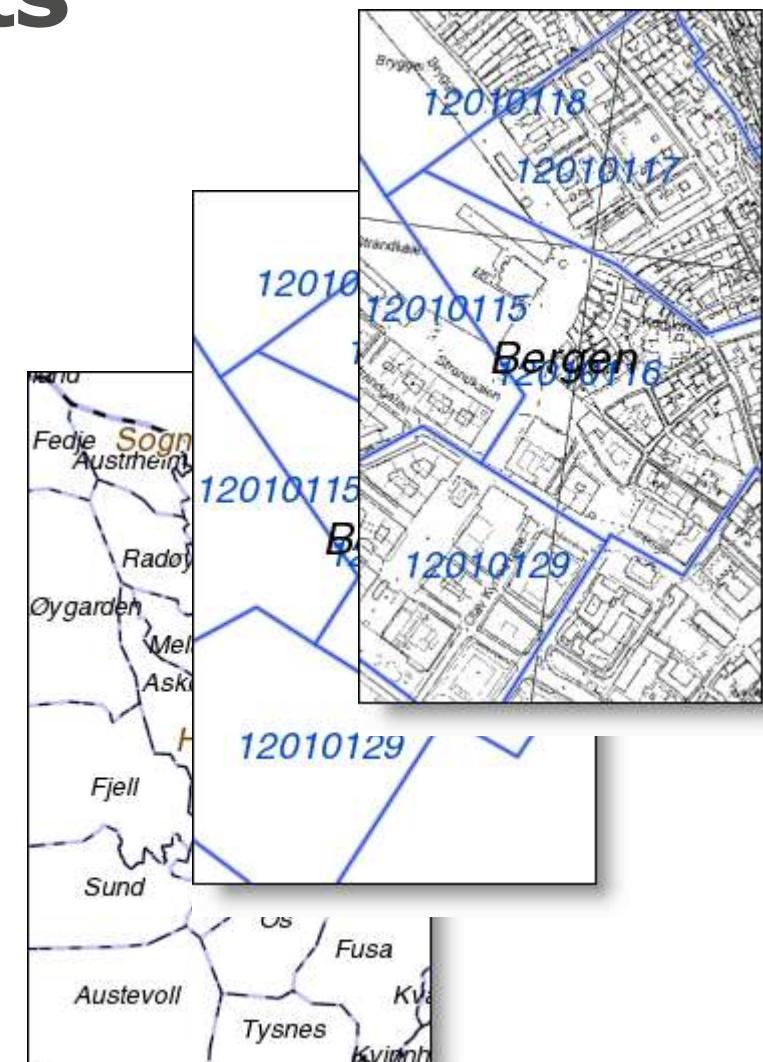
LinkToAdministrativeUnits : Class diagram

Created: 1/9/2012 6:09:56 PM
 Modified: 12/3/2012 11:39:24 AM
 Project:
 Advanced:

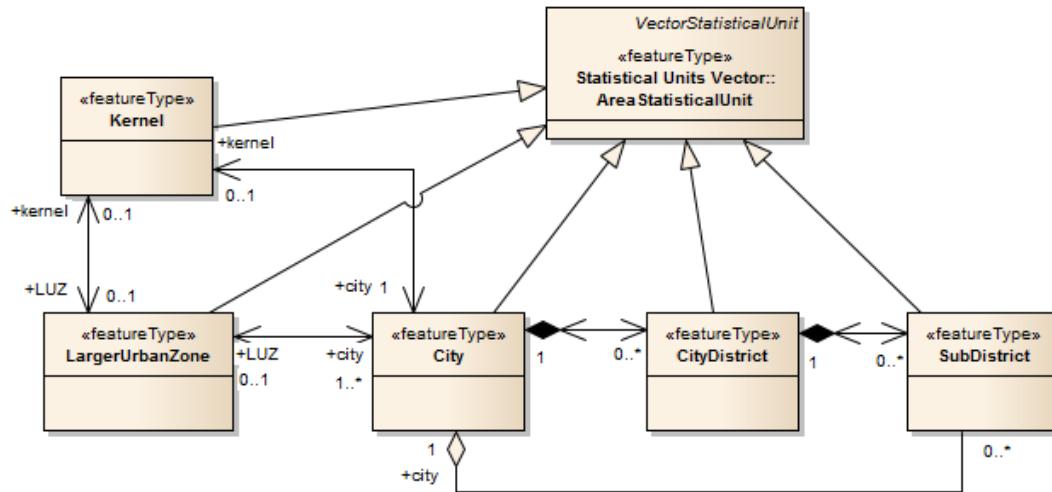


NUTS : Package diagram

Created: 10/8/2010 4:47:36 PM
 Modified: 6/14/2011 4:50:03 PM
 Project:
 Advanced:



Vector versions



class : Class diagram

Created: 9/7/2010 10:31:24 AM
Modified: 10/5/2012 9:54:13 AM
⊕ Project:
⊕ Advanced:

Also other area and grid systems can be used for statistics – in other themes

example fisheries statistics area management zones

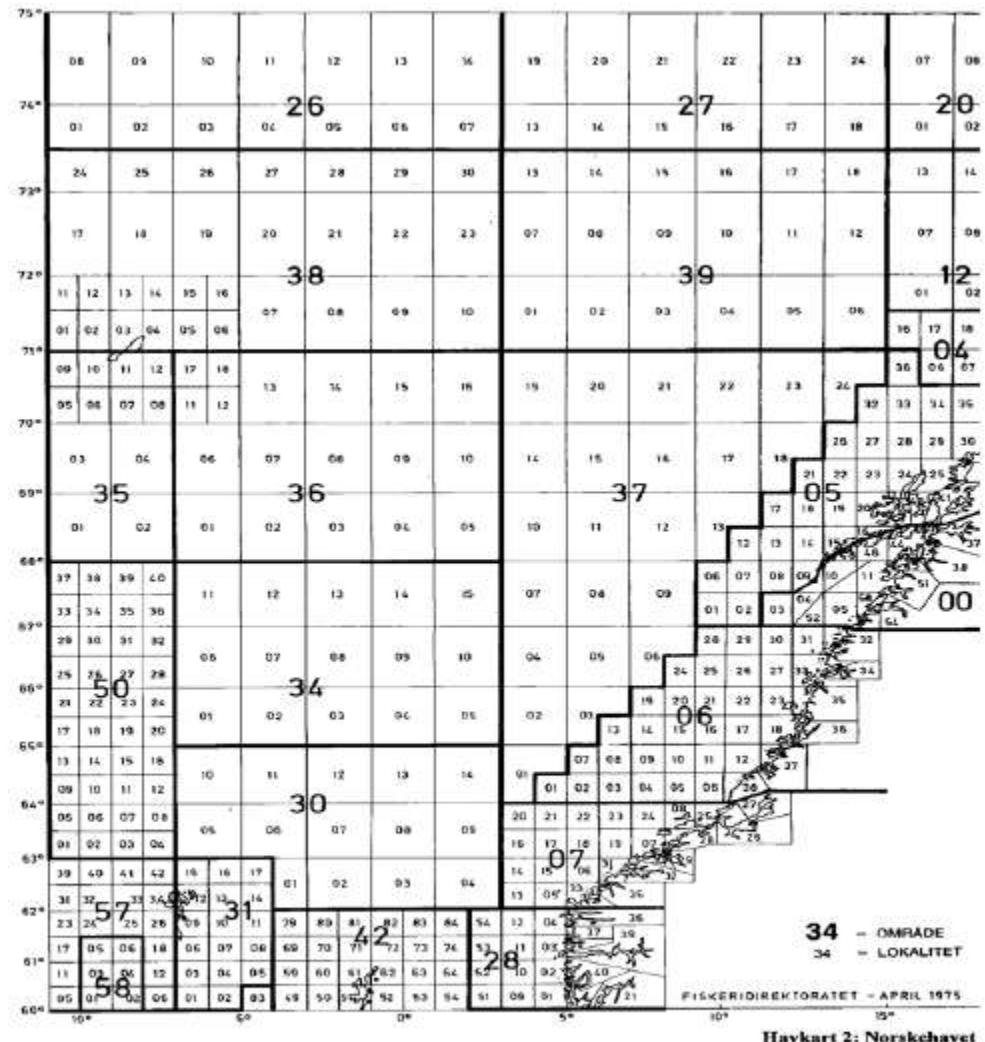


Fig. 6 Viser hovedområder og lokasjoner for fangststatistikk i Norskehavet.



Inspire specs and data models

population
distribution

Population distribution

Definition and description

Definition

Geographical distribution of people, including population characteristics and activity levels, aggregated by grid, region, administrative unit or other analytical unit.

Description

Population Distribution deals with datasets of statistical information describing how some phenomenon regarding human population is spread within some part of the 2D space. The theme has no direct spatial features, only contains attributes allowing to describe population phenomenon related to statistical units. Population data is linked to spatial object (statistical units) through their common identifier, e.g. NUTS codes.



A generic specification/model

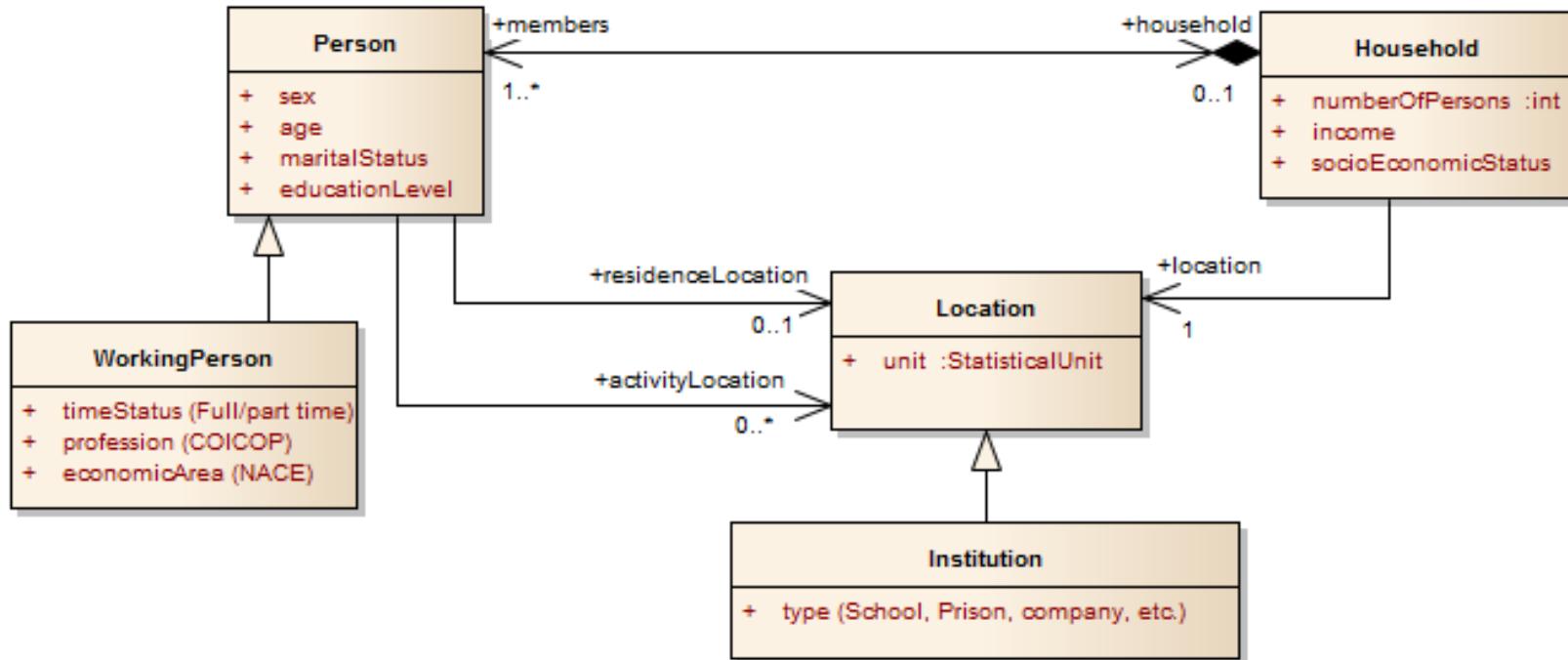
There are many different kinds of statistical data about human population: about people, dwellings, people at their work place, etc. This document does not intend to provide specifications for all these.

Common characteristics have been extracted and represented into a generic data model.

Using the data model described in this specification, all statistical data regularly organized in tables or data cubes can be provided in the INSPIRE framework.

basics

Attribute	Value
Value	<number>
classificationItem	"male"
geoReference	<Statistical Unit>



- The schema is structured with three types of classes:
 - “StatisticalDistribution”,
 - “StatisticalValue” and
 - “StatisticalValue.Dimensions” and two groups of code lists.

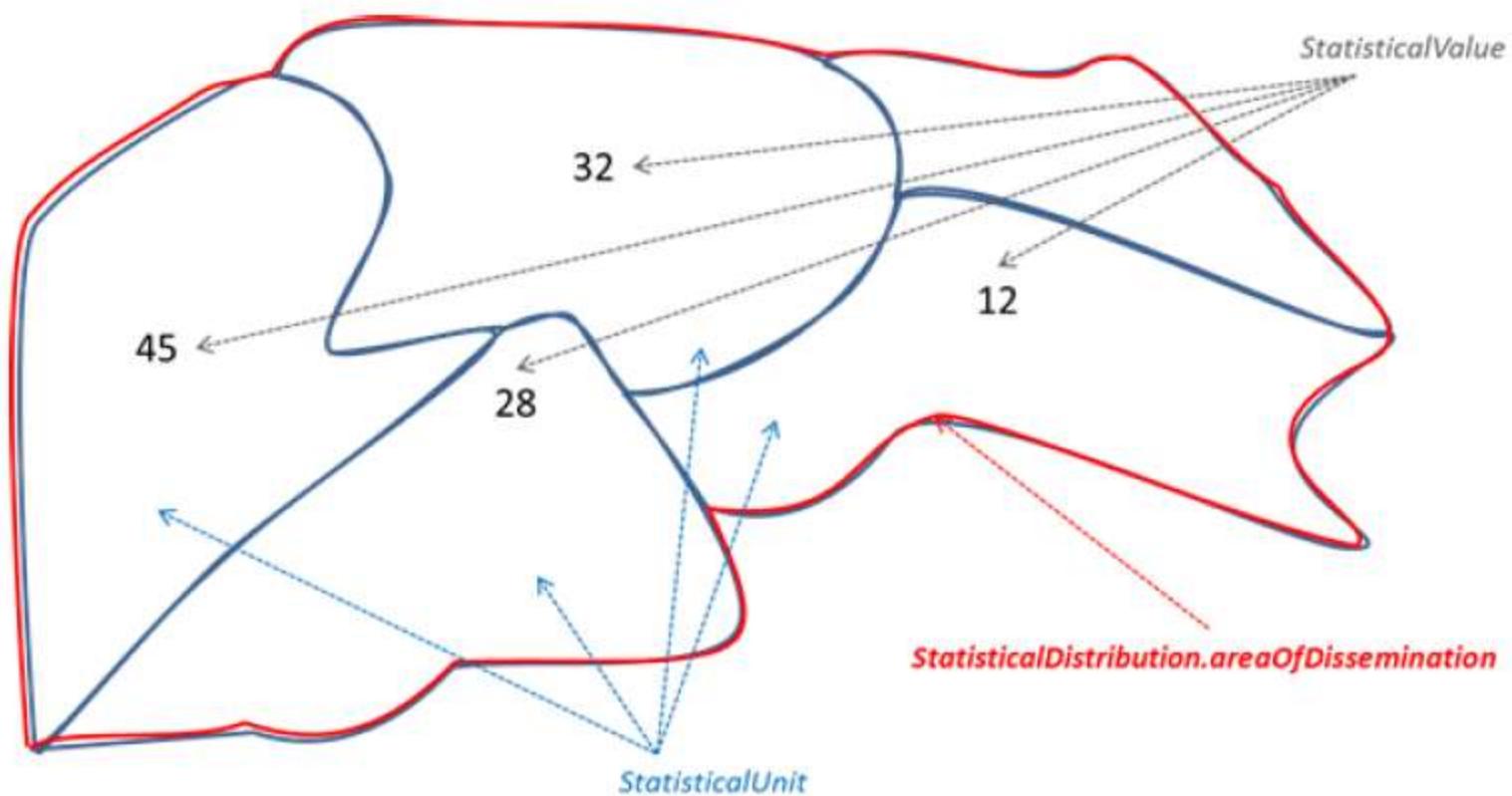


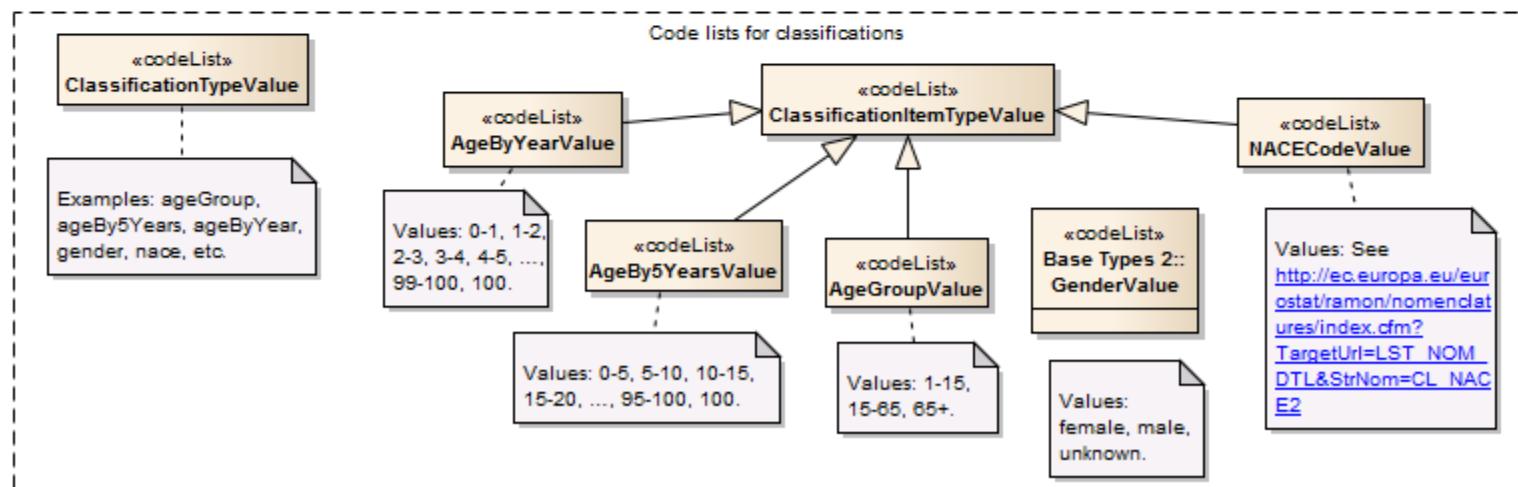
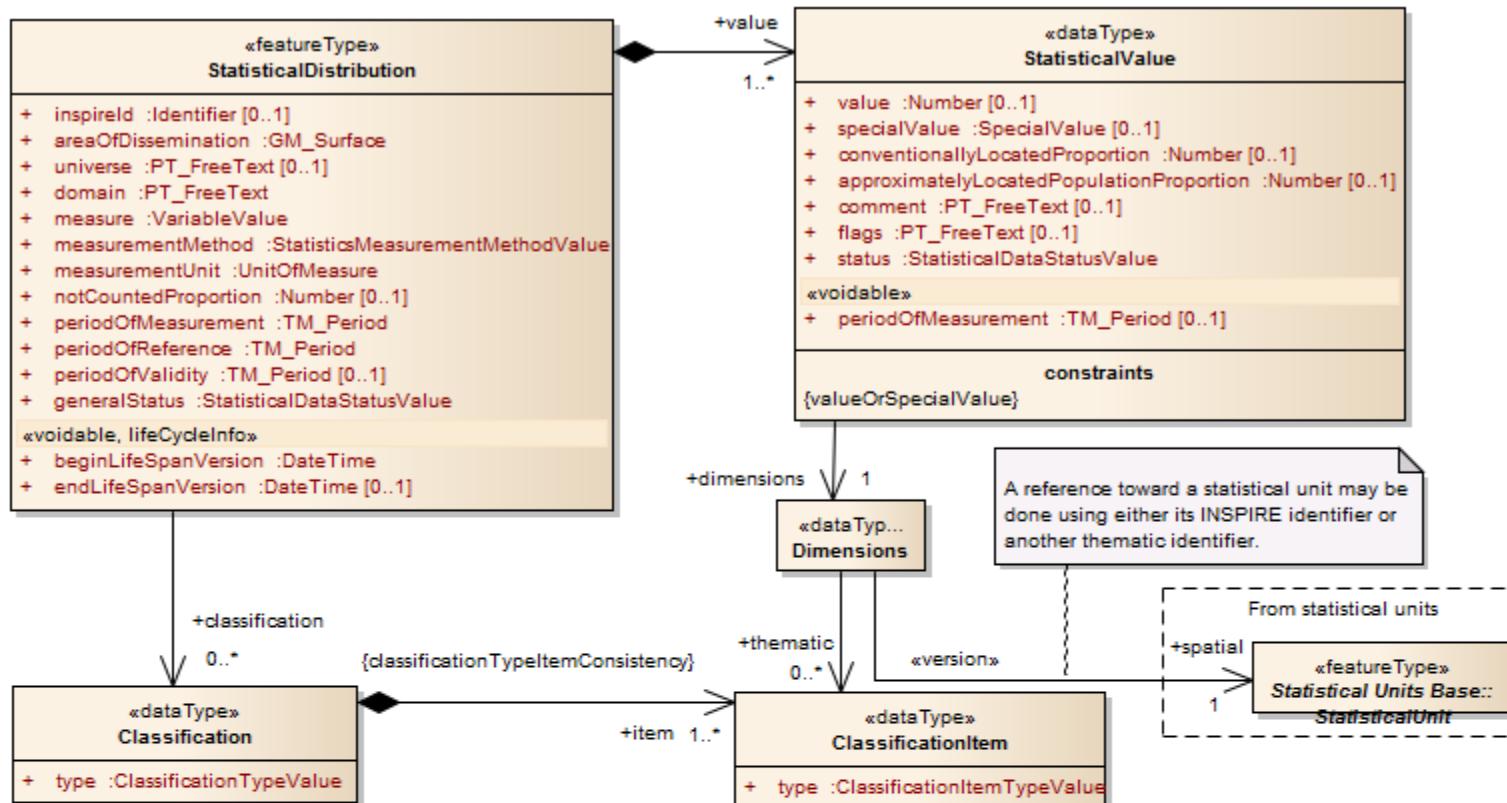
Figure 6: Statistical units, values and area of dissemination

Main attributes and values

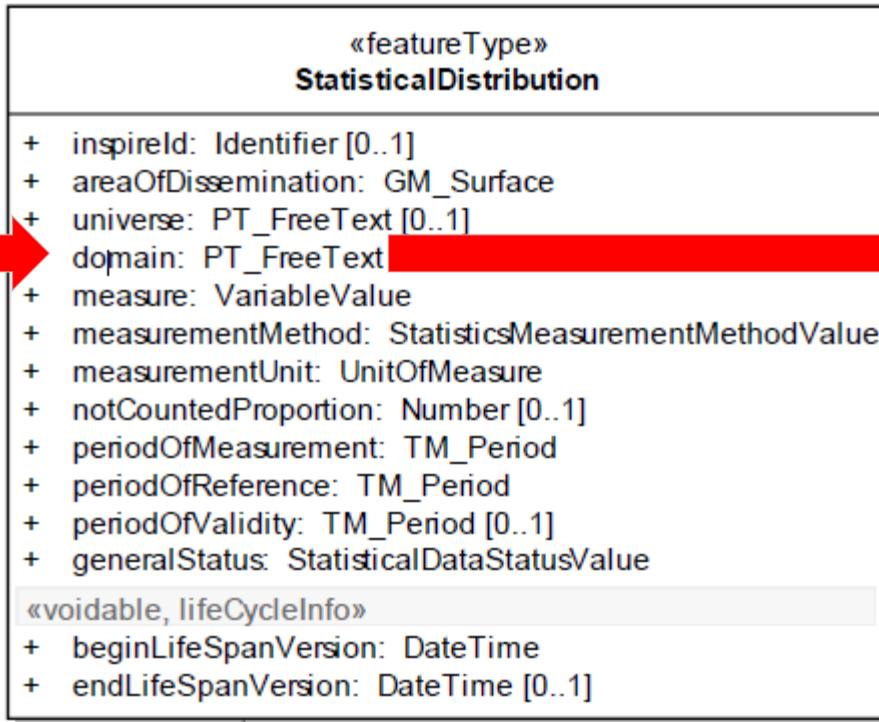
Example:

statisticalDistribution.classification
(1) gender
(2) ageBy5years

statisticalValue. dimensions.		
classificationItem(1)	classificationItem(2)	Value
female	0-5	134
male	0-5	141
female	5-10	128
male	5-10	111
female	10-15	89
:	:	:



attributes



List of **domains** from Eurostat's database

- Population and social conditions
- Economy and finance
- Agriculture, forestry and fisheries
- Industry, trade and services
- External Trade
- Transport
- Environment and energy
- Science and technology

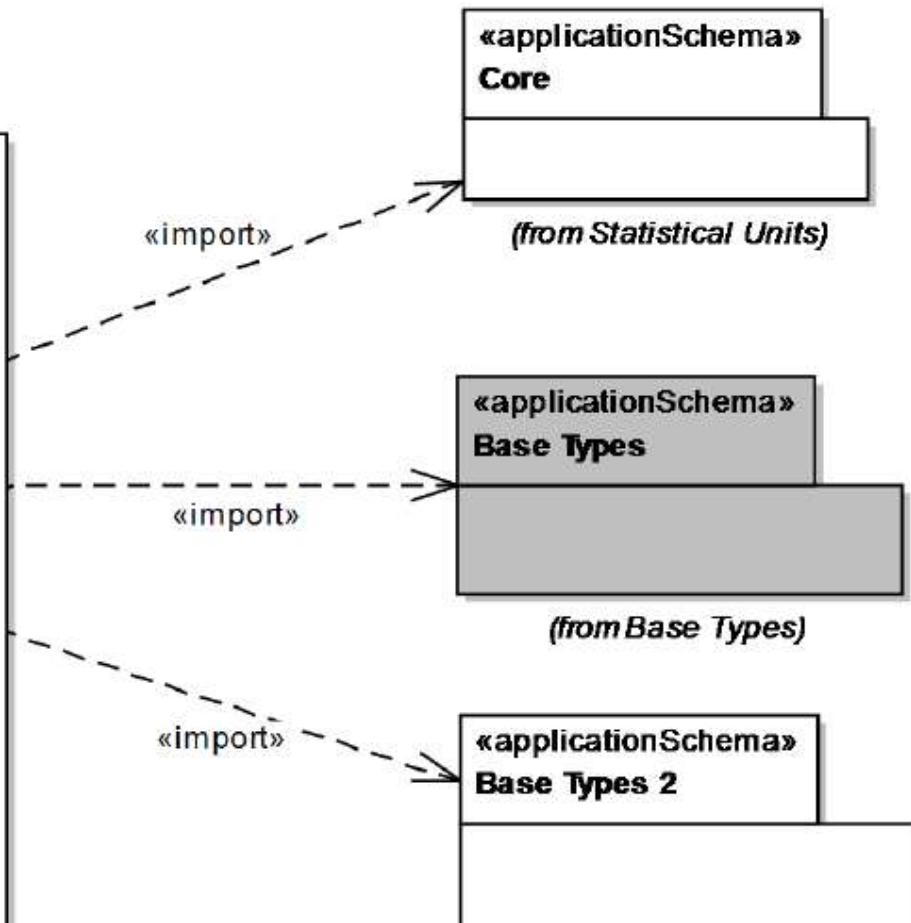
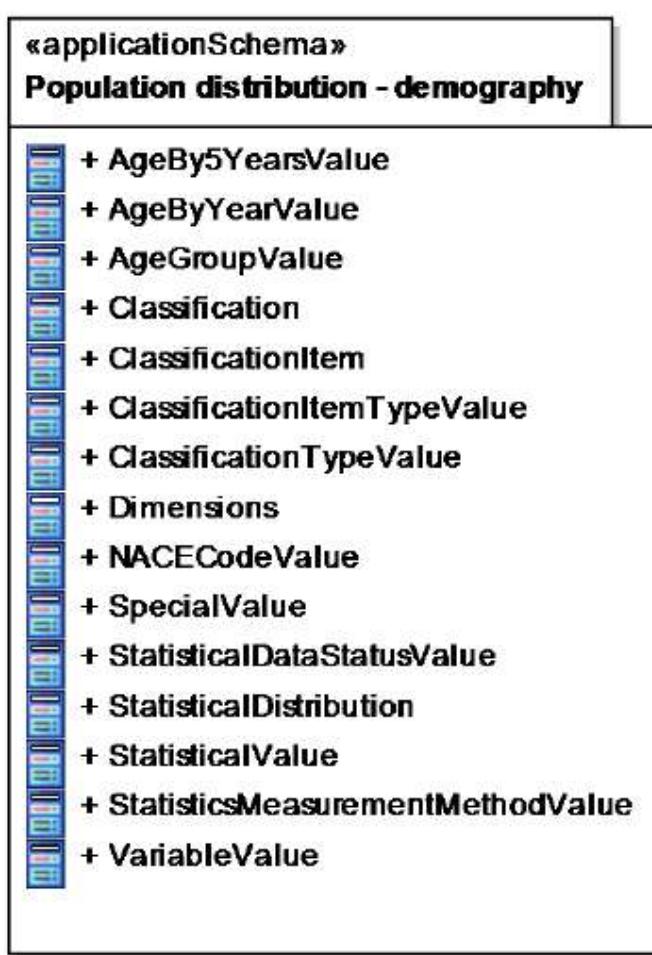
Universe if not to be classified in a domain

Inspire ID: not obliged to

Strip data model for your needs

Code lists, e.g. NACE

A	B	C	D
79		09.10	Support activities for petroleum and natural gas extraction
80		52.21	Service activities incidental to land transportation
81		52.22	Service activities incidental to water transportation
82	11.20 Service activities incidental to oil and gas extraction, excluding surveying	09.10	Support activities for petroleum and natural gas extraction
83	12.00 Mining of uranium and thorium ores	07.21	Mining of uranium and thorium ores
84		09.90	Support activities for other mining and quarrying
85	13.10 Mining of iron ores	07.10	Mining of iron ores
86		09.90	Support activities for other mining and quarrying
87	13.20 Mining of non-ferrous metal ores, except uranium and thorium ores	07.29	Mining of other non-ferrous metal ores
88		09.90	Support activities for other mining and quarrying
89	14.11 Quarrying of ornamental and building stone	08.11	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate
90		09.90	Support activities for other mining and quarrying
91	14.12 Quarrying of limestone, gypsum and chalk	08.11	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate
92		09.90	Support activities for other mining and quarrying
93	14.13 Quarrying of slate	08.11	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate
94		09.90	Support activities for other mining and quarrying
95	14.21 Operation of gravel and sand pits	08.12	Operation of gravel and sand pits; mining of clays and kaolin



Temporal reference system encoding

8.2.2 Temporal Reference System

Metadata element name	Temporal Reference System
Definition	Description of the temporal reference systems used in the dataset.
ISO 19115 number and name	13. referenceSystemInfo
ISO/TS 19139 path	referenceSystemInfo
INSPIRE obligation / condition	Mandatory, if the spatial data set or one of its feature types contains temporal information that does not refer to the Gregorian Calendar or the Coordinated Universal Time.
INSPIRE multiplicity	0..*
Data type(and ISO 19115 no.)	186. MD_ReferenceSystem
Domain	No specific type is defined in ISO 19115 for temporal reference systems. Thus, the generic MD_ReferenceSystem element and its reference SystemIdentifier (RS_Identifier) property shall be provided. NOTE More specific instructions, in particular on pre-defined values for filling the referenceSystemIdentifier attribute should be agreed among Member States during the implementation phase to support interoperability.
Implementing instructions	
Example	referenceSystemIdentifier: code: GregorianCalendar codeSpace: INSPIRE RS registry <gmd:referenceSystemInfo> <gmd:MD_ReferenceSystem> <gmd:referenceSystemIdentifier> <gmd:RS_Identifier> <gmd:code> <gco:CharacterString>GregorianCalendar </gco:CharacterString> </gmd:code> <gmd:codeSpace> <gco:CharacterString>INSPIRE RS registry</gco:CharacterString> </gmd:codeSpace> </gmd:RS_Identifier> </gmd:referenceSystemIdentifier> </gmd:MD_ReferenceSystem>
< gmd:referencesysteminfo><="" td=""></br><>
Example XML encoding	



Inspire

- health data
models

Data linked to statistical units

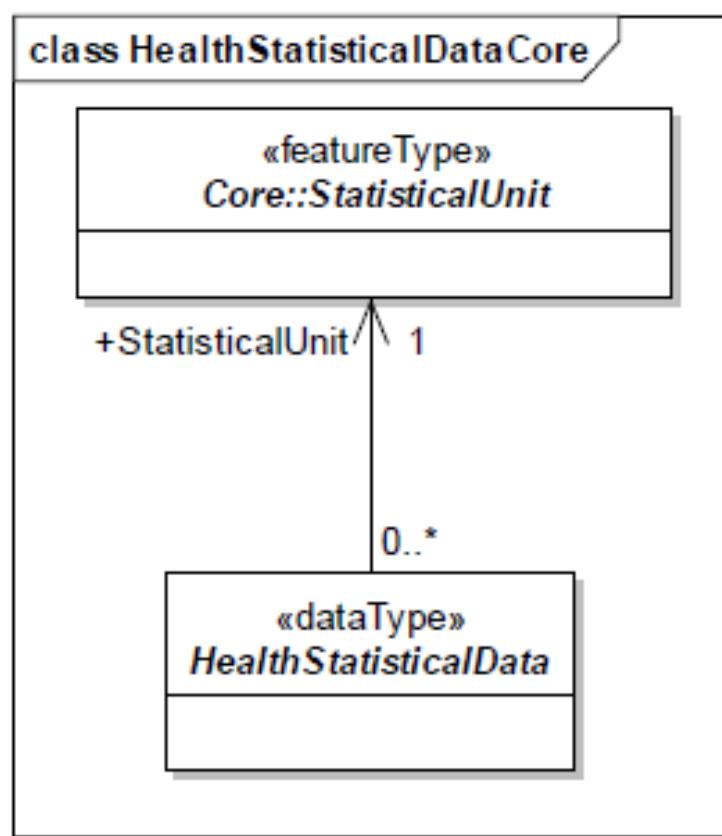
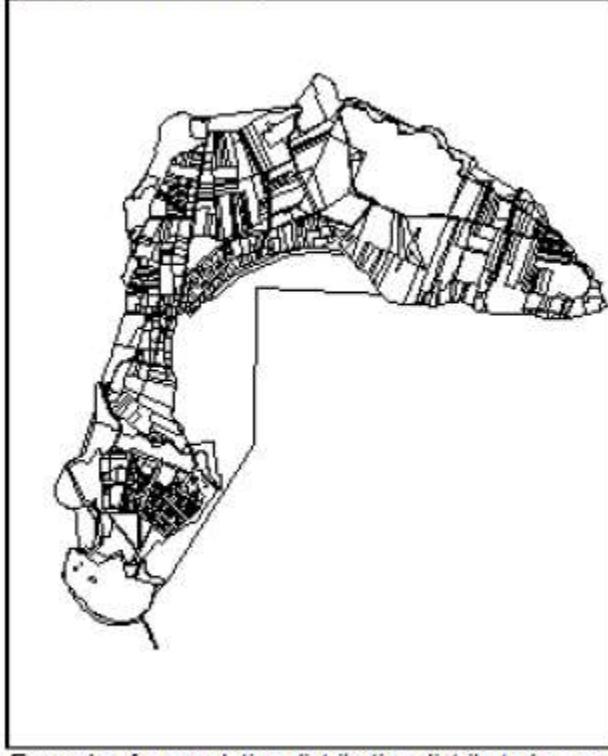


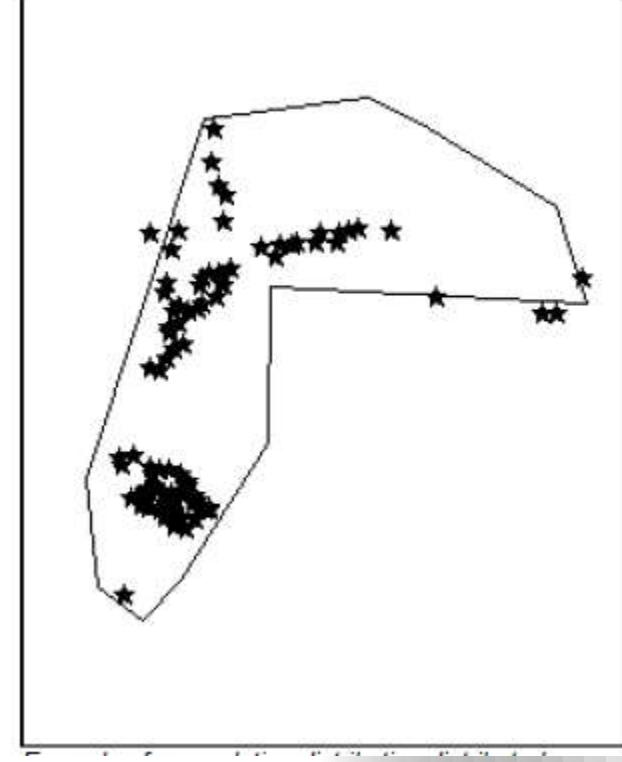
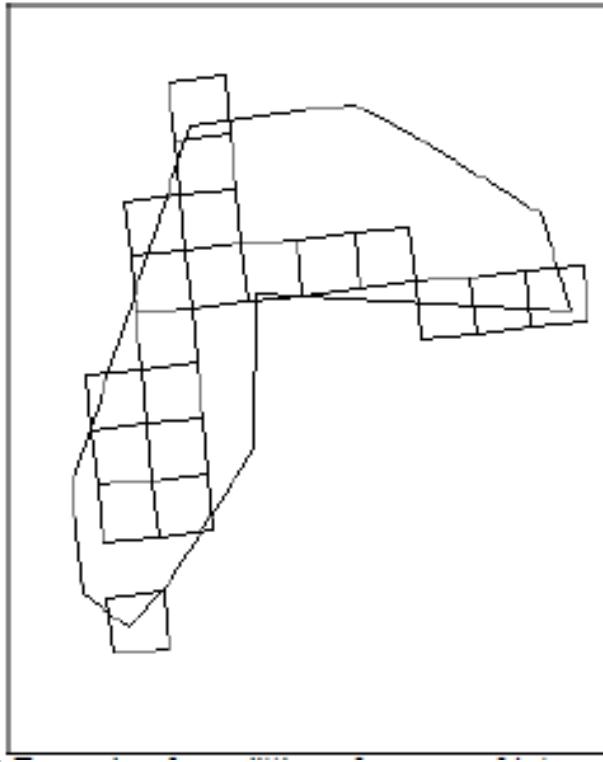
Figure 2 – UML class: `HealthStatisticalDataCore` diagram

Statistical units - geometry possibilities

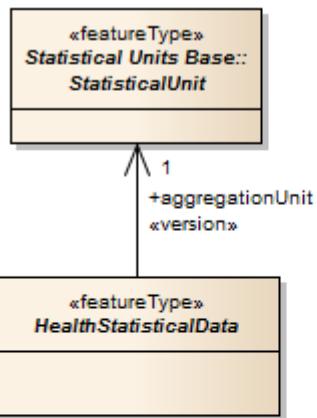
quality section 7.1.



Example of a population distribution distributed on a net

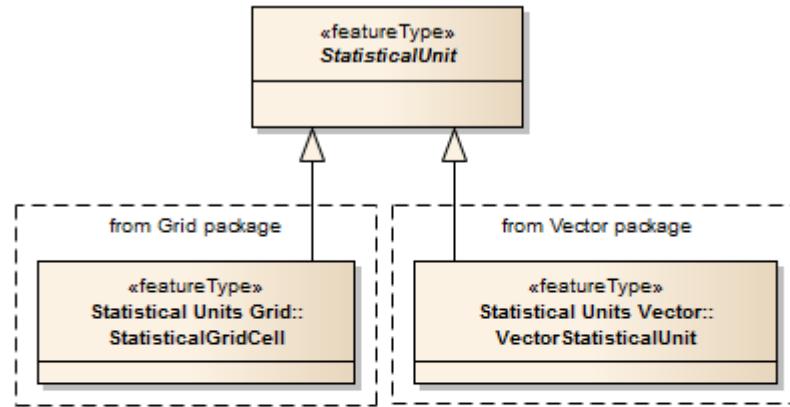


Periode for Measurement, for Reference, for validity ,
Rutenett på flere måter i flere annex'er, også her i stat-
unit/demography
Koordinat X, Y, EPSGkode, cellePosisjon, celleStørrelse, ikke krav
om LAEA



HealthStatisticalData - Core : Class diagr

Created: 3/3/2011 10:31:07 AM
 Modified: 12/4/2012 1:39:28 PM
[+ Project:](#)
[+ Advanced:](#)



class : Class diagram

Created: 9/7/2010 10:31:02 AM
 Modified: 10/5/2012 9:55:46 AM
[+ Project:](#)
[+ Advanced:](#)

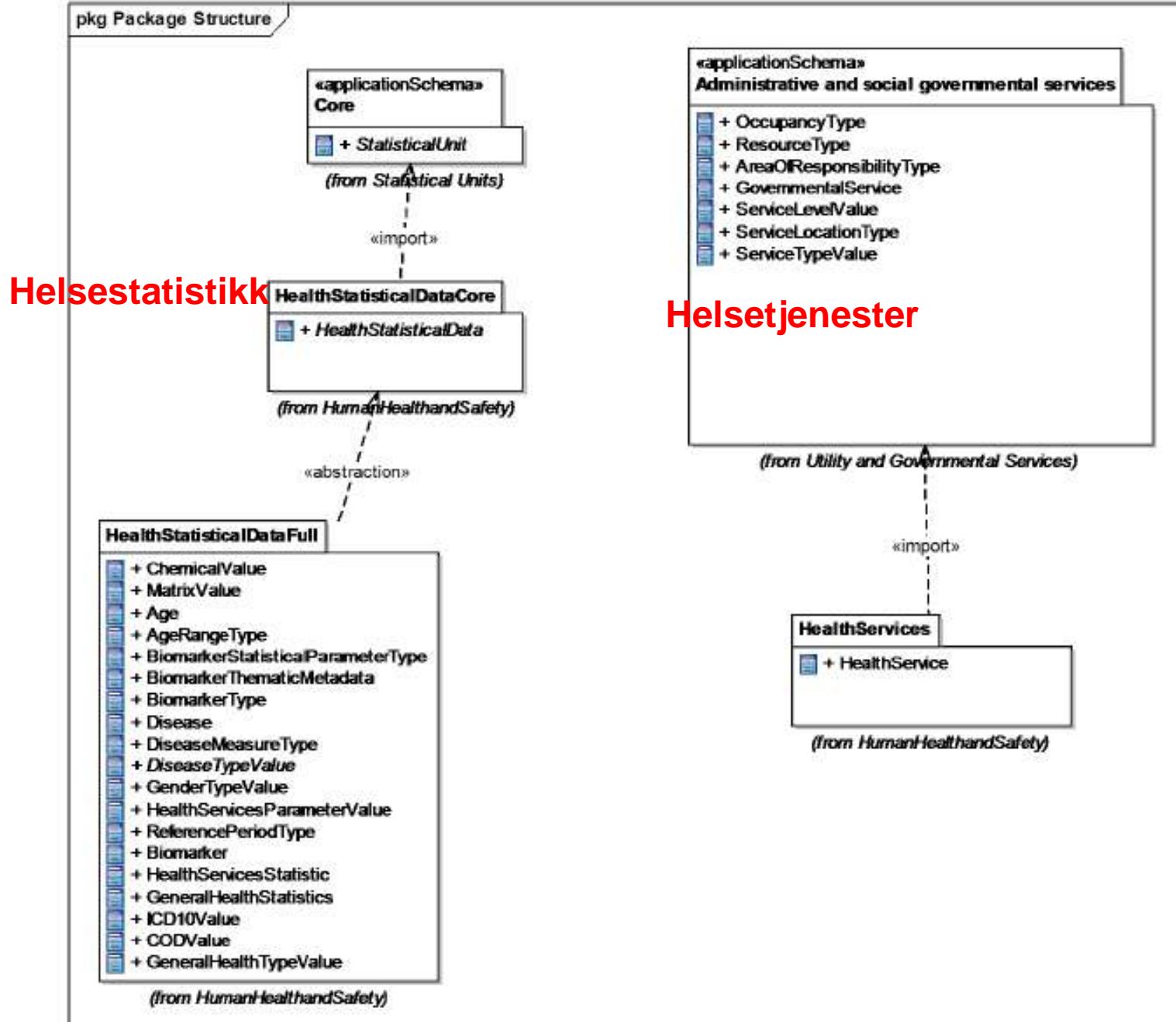


Figure 1 – UML class diagram: Overview of the Human Health and Safety package

HealthServicesStatistics is used (HealthServicesParameterValue).

class HealthServices

«featureType»	Administrative and social governmental services:: GovernmentalService
+ inspireId: Identifier	
+ serviceLocation: ServiceLocationType	
+ serviceType: ServiceTypeValue	
«voidable»	
+ additionalLocationDescription: PT_FreeText [0..1]	
+ areaOfResponsibility: AreaOfResponsibilityType [0..1]	
+ website: URL [0..1]	
+ name: PT_FreeText [0..1]	
+ note: PT_FreeText [0..1]	
+ resources: ResourceType [0..1]	
+ responsiblePartyContact: CI_ResponsibleParty [1..1]	
+ hoursOfService: PT_FreeText	
+ serviceLevel: ServiceLevelValue [0..1]	
+ emergencyPlan: CI_Citation [0..1]	
+ occupancy: OccupancyType [0..1]	
+ validFrom: DateTime	
+ validTo: DateTime [0..1]	
«lifeCycleInfo, voidable»	
+ beginLifespanVersion: DateTime	
+ endLifespanVersion: DateTime [0..1]	
constraints	
{endLifespanVersion}	
{validTo}	

«union»	Administrative and social governmental services::ServiceLocationType
+ serviceLocationByAddress: Address	
+ serviceLocationByBuilding: Building [1..1]	
+ serviceLocationByGeometry: GM_Object	
+ serviceLocationByFacility: Facility	

«codeList»	Administrative and social governmental services::ServiceTypeValue

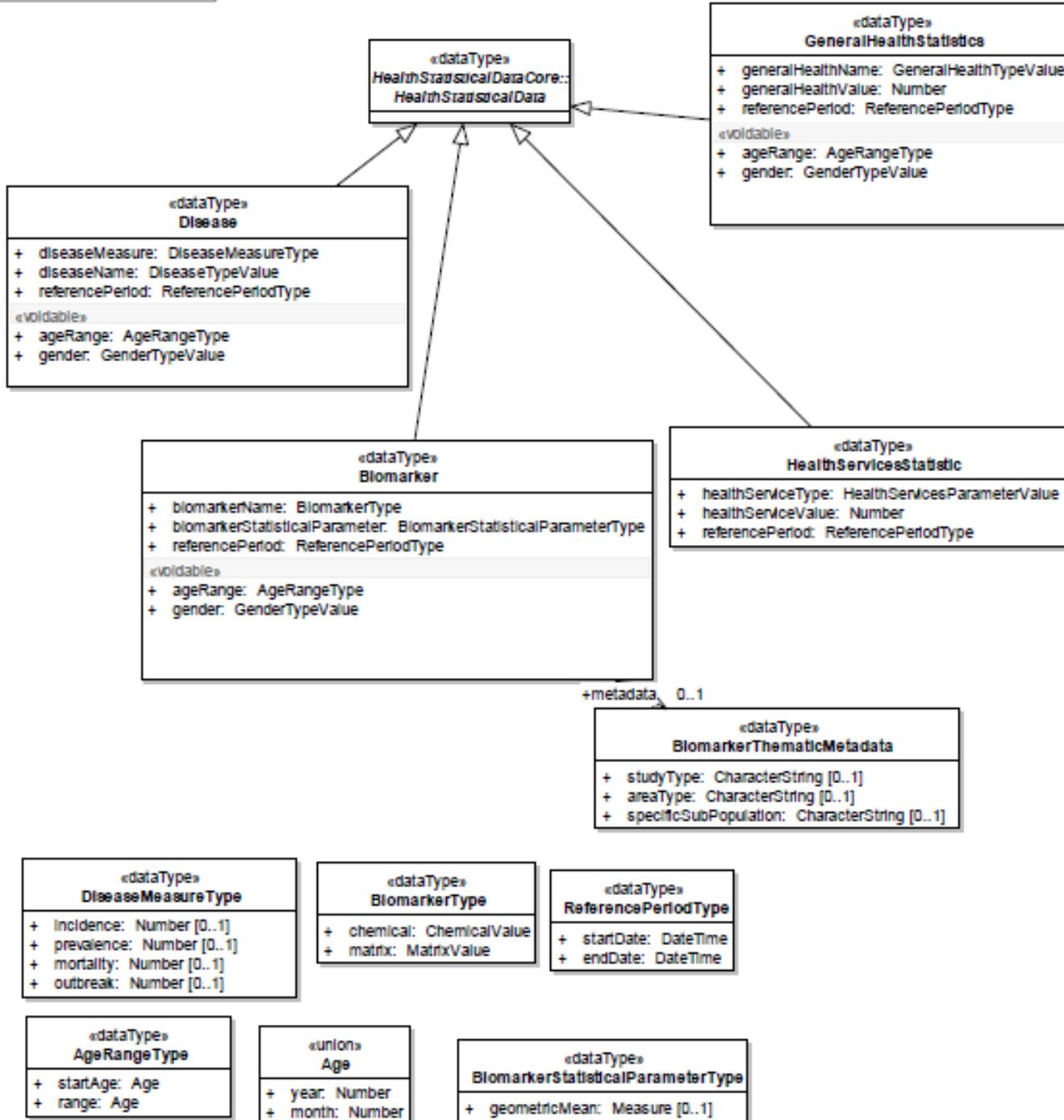
«featureType»	HealthService
+ healthServiceParameter: HealthServicesParameterValue	
+ healthServiceValue: Number	
+ referencePeriod: ReferencePeriodType	

Constraints:
ServiceType value
must be one of the
ServiceTypeValue
related to health

«codeList»	HealthStatisticalDataFull:: HealthServicesParameterValue
+ hospitalBed	
+ physician	
+ healthCareExpenditure	
+ curativeHospitalBed	
+ averageLengthOfStay	
+ psychiatricCareBed	
+ discharge	
+ bedDays	
+ dayCases	
+ practisingPhysician	



class HealthStatisticalDataFull





Inspire data harmonisation



INSPIRE

Infrastructure for Spatial Information in the European Community

European Commission > INSPIRE > Data Specifications

About

[Home](#)

[About INSPIRE](#)

[Legislation](#)

[History](#)

[Who's who in INSPIRE](#)

[INSPIRE library](#)

[INSPIRE Conferences](#)

Implementation

[Roadmap](#)

[Monitoring and Reporting](#)

[IOC](#)

[INSPIRE GeoPortal](#)

[Maintenance and](#)

[Implementation](#)

Adoption

[Roadmap](#)

[Implementing Rules](#)

[Monitoring and Reporting](#)

[Metadata](#)

[Data Specifications](#)

[Network Services](#)

[Spatial Data Services](#)

[Data and Service Sharing](#)

Data Specifications

[Legislation](#) [Who](#) [Consultations](#) [Testing](#) [Roadmap](#) [Library](#) [News](#) [Themes](#) [Data Models](#)

INSPIRE data models

The INSPIRE Implementing Rules on interoperability of spatial data sets and services and the data specification guidance documents are based on the UML data models developed by the INSPIRE Thematic Working Groups. These data models are managed in a common UML repository, which also stores older revisions of the models.

This page makes different revisions of the INSPIRE UML models available in different formats and views (see below). Each of these revisions corresponds to a specific set of (draft or approved) Data Specification Technical Guidance (TG) documents and/or Implementing Rules.

Revision	Corresponding TG and IRs	Status	Feature catalogue	HTML view	Mapping Tables	EA project / XMI	SVN	GML & code lists
4618	This version corresponds to the content of the Implementing Rules (EU) No 1089/2010, No 102/2011, No 1253/2013 and the latest publicly available version of the data specifications of Annex I, II+III.	APPROVED	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository
	This distribution contains only those data models that are contained in the amendment to the Implementing Rules for Annex II+III themes, including the updates of the Annex I data themes.	APPROVED (IR models)	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository (IR models)
	This distribution combines the data models contained in the amendment to the Implementing Rules (see above) and the extended data models contained in the data specification Technical Guidelines (but not in the IRs). Please note that the extended data models not included in the IRs should be considered as draft and therefore be used with caution.	DRAFT (extended models)						Schema repository (extended models)

Show older versions

2. How to transform data to comply with INSPIRE data specifications

- The data will need to be transformed to structures so that it is comparable with data from other organisations
- The INSPIRE data specifications describe the requirements for each of the 34 data themes.

Here focus on two themes Statistical Units and Population distribution – demography

- *Map existing data schema to the new INSPIRE data schema. (changing the database to meet INSPIRE structures at source or by transforming it before publication).*
- *Data transformation tools are included in some software products and are available to purchase.*

Mapping your data

- *Preferably in case you have no existing data schema. Use the INSPIRE data schema and change the database to meet INSPIRE structures at source*
- [http://inspire.ec.europa.eu/documents
/Data_Specifications/INSPIRE_DataSpecification_PD_v3.0.pdf](http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_PD_v3.0.pdf)

Transforming your data?

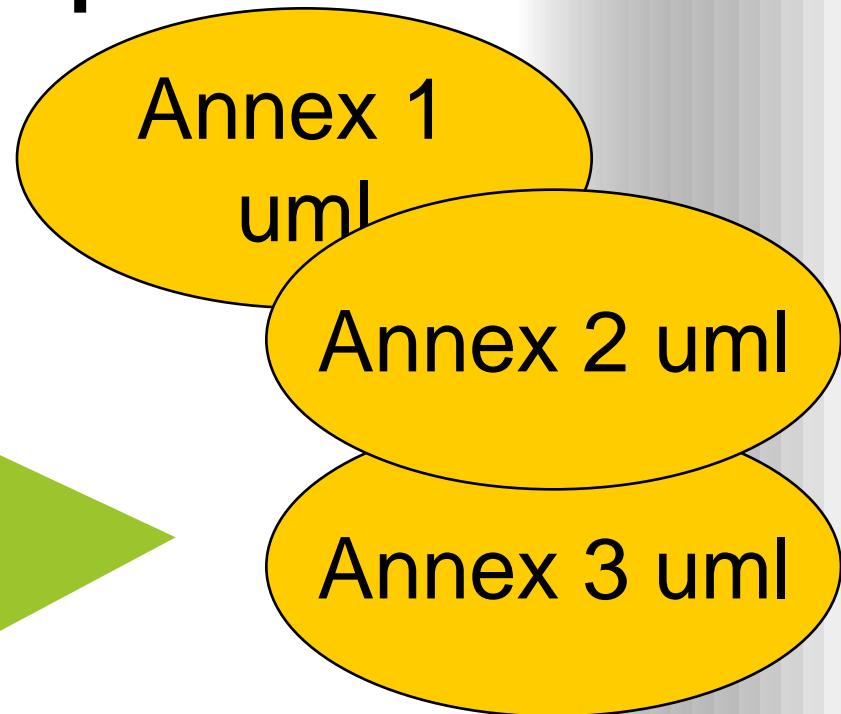
- See figure 4 (page 28) in document
http://inspire.ec.europa.eu/documents/DataSpecifications/INSPIRE_DataSpecification_PD_v3.0.pdf
- Is the class value for gender and age groups divided. Is a transformation necessary, since the datastructure in slide 15 combine gender and age?
- In case transformation is needed. Dividing gender and age can be used as an example

Harmonisation: make Inspire data sets/services

National data



Inspire services



- Coordinatref sys, format, schematransformation etc

ELF Matching activities 2013

- Summer 2013 : Analysis on expected workload or thematic problems for harmonisation between national data and Inspire data (easy, difficult...)
- 12 Sept 2013: Matching tables from Each country should be made
- 19 Sept 2013: Work will be done to bring together country deliveries on matching tabeles. Norway is responsible for joining country results for matching tables on "Addresses"

Mapping table

Application Schema 'Statistical Units Base' (version 3.0)							Application Schema 'Statistical Units Base' (version 3.0)			
Type	Documentation	Attribute / Association role / Constraints	Attribute / Association role / Constraints	Values / Enumerations	Multiplicity	Validable / Non-Validable	Type	Documentation	Attribute / Association role / Constraints	Attribute / Association role / Constraints

```

<?xml version="1.0" encoding="UTF-8"?>
<Workbook xmlns:x="urn:schemas-microsoft-com:officexml:html">
  <x:DocumentProperties xmlns="urn:schemas-microsoft-com:officexml:html">
    <x:Author>ShapeChange</x:Author>
  </x:DocumentProperties>
  <x:Styles>
    <x:Style ss:Name="Normal" ss:ID="Default">
      <Alignment/>
      <Borders/>
      <Font/>
      <Interior/>
      <NumberFormat/>
      <Protection/>
    </Style>
    <x:Style ss:ID="s0">
      <Alignment ss:WrapText="1" ss:Vertical="Top">
        <Font ss:Size="8.0"/>
      </Alignment>
    </Style>
  </x:Styles>
  <x:Tables>
    <x:Table ss:Name="Table1" ss:ID="t0">
      <Row>
        <Cell><?xml version="1.0" encoding="UTF-8"?><Workbook xmlns:x="urn:schemas-microsoft-com:officexml:html"><x:DocumentProperties xmlns="urn:schemas-microsoft-com:officexml:html"><x:Author>ShapeChange</x:Author></x:DocumentProperties><x:Styles><x:Style ss:Name="Normal" ss:ID="Default"><Alignment/><Borders/><Font/><Interior/><NumberFormat/><Protection/></Style><x:Style ss:ID="s0"><Alignment ss:WrapText="1" ss:Vertical="Top"><Font ss:Size="8.0"/></Alignment></Style></x:Styles><x:Tables><x:Table ss:Name="Table1" ss:ID="t0"><Row><Cell>

```

```
<?xml version="1.0" encoding="UTF-8"?>
<Workbook xmlns:x1="urn:schemas-microsoft-com:office:excel" xmlns:ss="urn:schemas-micro-
xmins:html="http://www.w3.org/TR/REC-html40" xmlns:x="urn:schemas-microsoft-com:offi
- <DocumentProperties xmlns="urn:schemas-microsoft-com:office:office">
  <Author>ShapeChange</Author>
</DocumentProperties>
- <Styles>
  - <Style ss:Name="Normal" ss:ID="Default">
    <Alignment/>
    <Borders/>
    <Font/>
    <Interior/>
    <NumberFormat/>
    <Protection/>
  </Style>
  - <Style ss:ID="s0">
    <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
    <Font ss:Size="8.0"/>
  </Style>
  - <Style ss:ID="s1">
    <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
    <Font ss:Size="8.0"/>
    <Interior ss:Pattern="Solid" ss:Color="#FCF305"/>
  </Style>
  - <Style ss:ID="s2">
    <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
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      <Border ss:Weight="2" ss:Position="Bottom" ss:LineStyle="Continuous"/>
      <Border ss:Weight="2" ss:Position="Left" ss:LineStyle="Continuous"/>
      <Border ss:Weight="2" ss:Position="Right" ss:LineStyle="Continuous"/>
      <Border ss:Weight="2" ss:Position="Top" ss:LineStyle="Continuous"/>
    </Borders>
    <Font ss:Size="12.0" ss:Bold="1"/>
    <Interior ss:Pattern="Solid" ss:Color="#99CCFF"/>
  </Style>
  - <Style ss:ID="s3">
    <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
    - <Borders>
      <Border ss:Weight="2" ss:Position="Bottom" ss:LineStyle="Continuous"/>
      <Border ss:Weight="1" ss:Position="Left" ss:LineStyle="Continuous"/>
```

Results, matching tables, ELF

matching tables, Inspire-ELF, xls

Application Schema 'AdministrativeUnits' (version 3.0)							BE (IGN-B)		CZ (CUZK)		DE (E)
Type	Documentation	Attribute / Association role / Constraint	Attribute / Association role / Constraint	Values / Enumerations	Multiplicity	Voidable / Non-Voidable	Status	Remarks	Status	Remarks	Status
administrativeBoundary	A line of demarcation between administrative units.						difficult	not in the database	Easy		
		geometry	Geometric representation of boundary line.	GM_Curve	1		difficult	not in the database but can be generated	Easy		
		inspireId	External object identifier of the spatial object (ID).	Identifier	1		not available	not in the database and cannot be created	Easy		
		country	Two-character country code according to the ISO 3166-1 alpha-2 code.	CountryCode* BE* http://www.codelist.be/cte/iso3166_1_alpha_2_code_v1.xls	1		easy		Easy	Czech Republic	
		nationalLevel	The hierarchy levels of all administrative units (administrative_level).	AdministrativeHierarchyLevel* http://www.codelist.be/cte/administrative_hierarchy_level_v1.xls	1..6		difficult	not in the database but can be generated	Easy		
		legalStatus	Legal status of this administrative unit.	LegalStatusValue* http://www.codelist.be/cte/legal_status_value_v1.xls	1	voidable	easy	not in the database but can be easily generated	Easy		
		technicalStatus	The technical status of the administrative unit.	TechnicalStatusValue* http://www.codelist.be/cte/technical_status_value_v1.xls	1	voidable	easy	not in the database but can be easily generated	Easy		
		beginLifespanVersion	Date and time at which the version of the spatial administrative unit was started.	DateTime	1	voidable	not available		Easy		
		endLifespanVersion	Date and time at which the version of the spatial administrative unit was ended.	DateTime	0..1	voidable	not available		Not Available		
		adminUnit	The administrative units represented by this administrative boundary.	AdministrativeUnit	1..*	voidable	difficult	not in the database but can be generated	Easy		
administrativeUnit	Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.						easy	in the database	Easy		
		geometry	Geometric representation of spatial area covered by the administrative unit.	GM_MultiSurface	1		difficult	not in the database but can be generated	Easy		
		nationalCode	Thematic identifier corresponding to the administrative unit.	CharacterString	1		easy	in the database	Easy	Czech Republic	
		inspireId	External object identifier of the spatial object (ID).	Identifier	1		easy	not in the database but can be easily generated	Easy		
		nationalLevel	Level in the national administrative hierarchy.	AdministrativeHierarchyLevel* http://www.codelist.be/cte/administrative_hierarchy_level_v1.xls	1		easy	not in the database but can be easily generated	Easy		
		nationalLevelName	Name of the level in the national administrative hierarchy.	LocalisedCharacterString	1..*	voidable	difficult	not in the database but can be generated	Easy		
		country	Two-character country code according to the ISO 3166-1 alpha-2 code.	CountryCode* BE* http://www.codelist.be/cte/iso3166_1_alpha_2_code_v1.xls	1		easy	not in the database but can be easily generated	Easy		
		name	Official national geographical name of the administrative unit.	GeographicalName	1..*		difficult	not in the database but can be generated	Easy		
		residenceOfAuthorit	Center for national or local administration.	NamedPlace	1..*	voidable	not available		Not Available		
		beginLifespanVersi	Date and time at which the version of the spatial administrative unit was started.	DateTime	1	voidable	difficult	in the database but not	Easy		



Inspire harmonisation

- example
health

Health care/services data + sources

• Eurostat – statistical data on nuts 1 or 2

- Health care: resources and patients (non-expenditure data) (t_hlth_care)
- Practising physicians (tps00044)
- Licensed physicians (tps00167)
- Practising dentists (tps00045)
- Hospital beds (tps00046)
- Curative care beds in hospitals (tps00168)
- Psychiatric care beds in hospitals (tps00047)
- Discharges from hospitals (tps00048) – use of the different services
- Health care: indicators from surveys (SILC, HIS round 2004) (t_hlth_care1)
- Self reported unmet need for medical examination or treatment, by income quintile (tsdph270)
- Important
 - Space resolution, nuts 1+2+municipality
 - time resolution



Portrayal and formats

Portrayal – statistical unit

11.2.2 Styles for the layer SU.StatisticalGridCell

Style Name	SU.StatisticalGridCell
Default Style	Yes
Style Title	Statistical grid cell default style.
Style Abstract	The default style for Statistical grid cells draws the grid a light yellow transparent fill. <u>For surface geometries:</u> Fill colour: light yellow, transparency 0.2 (RGBA 228 255 0 !) <u>Examples:</u> 

Fill colour: light yellow, transparency 0.2 (RGBA 228 255 0 51)
Outline colour: solid, magenta (RGB 255 0 255)
Outline width: 3pt

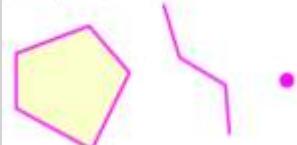
For linear geometries:

Colour: solid, magenta (RGB 255 0 255)
Outline width: 3pt

For punctual geometries:

Style: circle
Fill colour: solid, magenta (RGB 255 0 255)
Width: 3pt

Examples:



```
<sld:NamedLayer>
  <se:Name>SU.StatisticalGridCell</se:Name>
  <sld:UserStyle>
    <se:Name>SU.StatisticalGridCell.Default</se:Name>
    <sld:IsDefault>1</sld:IsDefault>
    <se:FeatureTypeStyle version="1.1.0">
      <se:Description>
        <se:Title>Statistical grid cell default style</se:Title>
        <se:Abstract></se:Abstract>
      </se:Description>
      <se:FeatureTypeName>SU.StatisticalGridCell
      </se:FeatureTypeName>

      <Rule>
        <se:PolygonSymbolizer>
          <se:Geometry>
            <ogc:PropertyName>geometry</ogc:PropertyName>
          </se:Geometry>
          <se:Fill>
            <se:SvgParameter name="fill">#e4ff00</se:SvgParameter>
            <se:SvgParameter name="fill-opacity">
              <se:Literal>0.2</se:Literal>
            </se:SvgParameter>
          </se:Fill>
        </se:PolygonSymbolizer>
      </Rule>

    </se:FeatureTypeStyle>
  </sld:UserStyle>
</sld:NamedLayer>
```

Formats - encodings

gml+geotiff

- **9.3.1 Default Encoding(s)**
- **9.3.1.1. Specific requirements for GML encoding**
- This data specification proposes the use of GML as the default encoding, as recommended in sections 7.2 and 7.3 of [DS-D2.7].
- **Grids encoding**
- For statistical data disseminated on grids, the following encodings are recommended:
- **Recommendation 31 The recommended encodings for statistical data disseminated on grids are: GeoTIFF, netCDF, GRIB, BUFR and JPEG2000.**

GML schema - the structure to be obtained

- <http://inspire.ec.europa.eu/schemas/pd/3.0/PopulationDistributionDemography.xsd>

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2014 sp1 (x64) (http://www.altova.com) by Chris Schubert (European Commission DG JRC - IES) -->
- <schema version="3.0" elementFormDefault="qualified" targetNamespace="http://inspire.ec.europa.eu/schemas/pd/3.0" xmlns:su-core="http://inspire.ec.europa.eu/schemas/su-core/3.0" xmlns:sc="http://www.interactive-instruments.de/ShapeChange/AppInfo" xmlns:pd="http://inspire.ec.europa.eu/schemas/pd/3.0" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:base2="http://inspire.ec.europa.eu/schemas/base2/1.0" xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3" xmlns="http://www.w3.org/2001/XMLSchema">
  - <annotation>
    <documentation>-- Name -- Population distribution - demography</documentation>
  </annotation>
  <import schemaLocation="http://inspire.ec.europa.eu/schemas/base/3.3/BaseTypes.xsd" namespace="http://inspire.ec.europa.eu/schemas/base/3.3" />
  <import schemaLocation="http://inspire.ec.europa.eu/schemas/base2/1.0/BaseTypes2.xsd" namespace="http://inspire.ec.europa.eu/schemas/base2/1.0" />
  <import schemaLocation="http://inspire.ec.europa.eu/schemas/su-core/3.0/StatisticalUnitCore.xsd" namespace="http://inspire.ec.europa.eu/schemas/su-core/3.0" />
  <import schemaLocation="http://portele.de/ShapeChangeAppinfo.xsd" namespace="http://www.interactive-instruments.de/ShapeChange/AppInfo" />
  <import schemaLocation="http://schemas.opengis.net/iso/19139/20070417/gmd/gmd.xsd" namespace="http://www.isotc211.org/2005/gmd" />
  <import schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd" namespace="http://www.opengis.net/gml/3.2" />
  <!--XML Schema document created by ShapeChange-->
  - <element substitutionGroup="gml:AbstractObject" type="pd:StatisticalValueType" name="StatisticalValue">
    - <annotation>
      <documentation>-- Name -- Statistical value -- Definition -- The pieces of datum of the distribution.</documentation>
    </annotation>
  </element>
  - <complexType name="StatisticalValueType">
    - <sequence>
      - <element type="double" name="value" minOccurs="0">
        - <annotation>
          <documentation>-- Name -- Value -- Definition -- The value for the piece of datum.</documentation>
        </annotation>
      </element>
      - <element type="gml:ReferenceType" name="specialValue" minOccurs="0">
        - <annotation>
          <documentation>-- Name -- Special value -- Definition -- Some conventional string when value for the piece of datum cannot be provided due to confidentiality.</documentation>
        </annotation>
      </element>
    </sequence>
  </complexType>
</schema>
```

Download – atom feed - wfs

- http://labs.kartverket.no/AtomFeedDemo1/Datasetfeed_NMG_demo1.xml
- <http://wfs.geonorge.no/skwms1/wfs.elf-lod1au?service=WFS&request=GetFeature&Version=2.0.0&typeNames=elf-lod1au:AdministrativeUnit&count=1&resolveDepth=1&resolve=local>
- <http://www.opengeospatial.org/standards/tjs>
- Table joining service

Projection and grid - LAEA

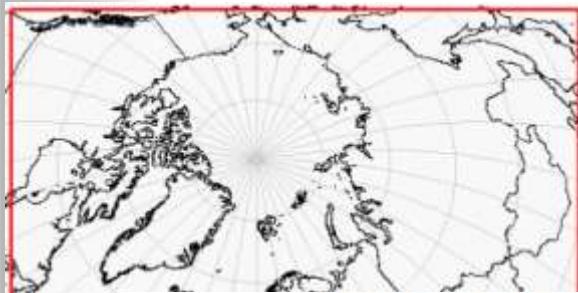


Figure 4: The LAEA extent



- [http://www.us.fo/files/
Filer/US/kort_og_skrar/
adressur/adressemode
2007/Danmark/E_GIS
79_ShortproceedEuroG
ridWS_EN.pdf](http://www.us.fo/files/Filer/US/kort_og_skrar/adressur/adressemode/2007/Danmark/E_GIS_79_ShortproceedEuroGridWS_EN.pdf)



End Questions