Marine spatial data infrastructure and sea basin cooperation

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BALTIC MSP FORUM

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Danish Ministry of the Environment
Danish Geodata Agency

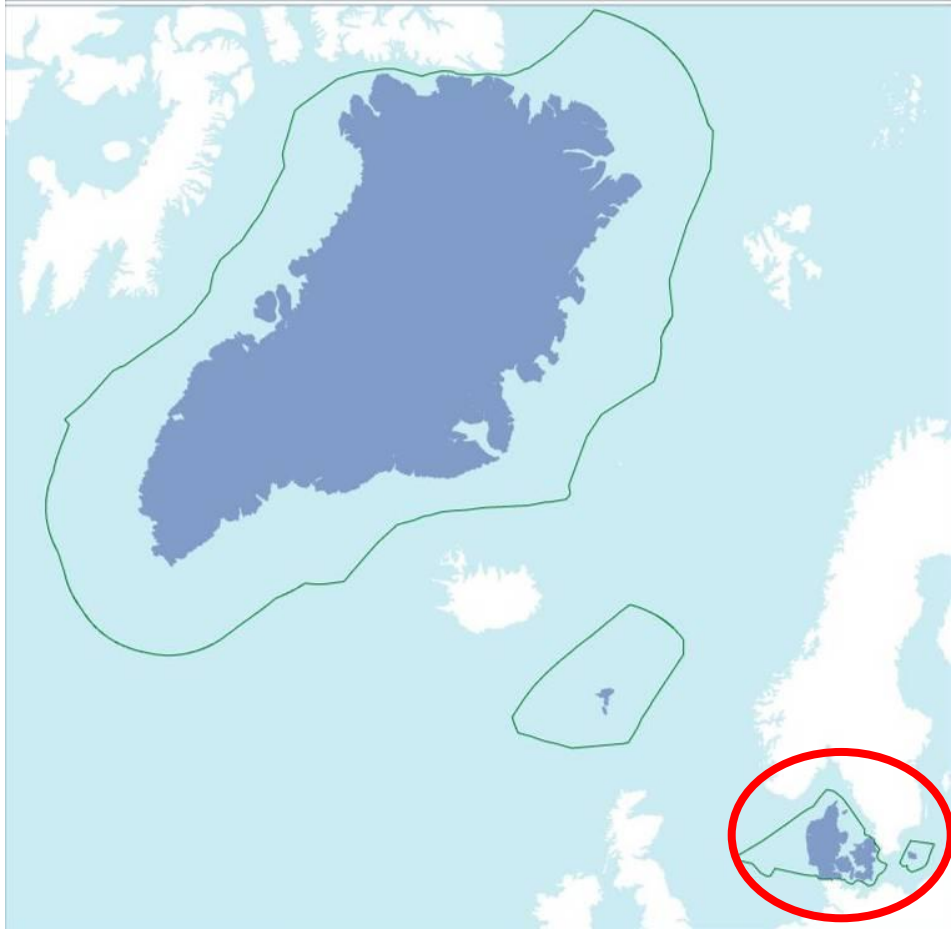
Agenda

- Traditional approach to hydrographic data
- Expectations within the marine / maritime field
- MSDI/SDI/MSP
- Hydrographic data and its role in MSDI
- A Danish MSDI

The Danish Geodata Agency

Responsibilities:

- Surveying land and sea
- Charting of land and sea
- Cadastre
- The geodata infrastructure



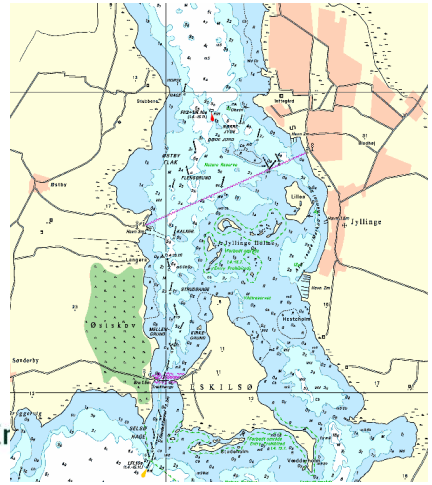
The Danish Nature Agency

Maritime spatial planning and integrated coastal management

Danish Ministry of the Environment
Danish Geodata Agency

Traditional approach to Hydrographic data

- One primary user, the mariner
- The primary products:
  - Paper chart
  - ENC - S57 data
  - Publications
  - Updates of products
- SOLAS (ECDIS - ENC)
- IHO:
  - standardisation
  - harmonisation
  - recommendations



SOLAS:

Chapter V regulation 19 2.1.4

Nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage; an Electronic Chart Display and Information System (ECDIS) may be accepted as meeting the chart carriage requirements of this subparagraph;

Chapter V regulation 27

Nautical charts and nautical publications, such as sailing directions, *lists of lights*, notices to mariners, *tide tables* and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

Expectations for development within the marine/maritime field:

- Increased activity with multiple uses
- Multiple stakeholders and users with demands for the same area
- Major external impact from “new” organisations e.g. EU:
  - INSPIRE Directive
  - Marine Strategy
  - Marine Spatial Planning
- Greater user involvement, including the possibility for citizens to track their “case”

- Increased demands for coordination and planning within the maritime area
- Increased demands for coordination of activities on land
- Increased demands for coordination with neighbouring countries

- **Not doing anything will not be an option**

MSDI

Geo Data of the Sea

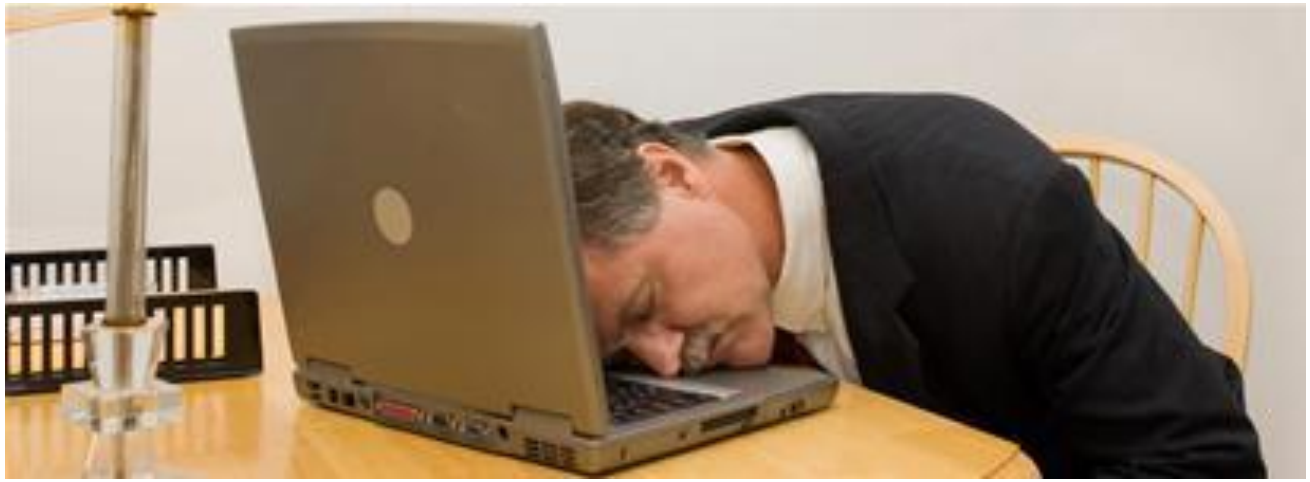
What is Spatial Data Infrastructure – SDI?

Global Spatial Data Infrastructure Association (GSDI) defines spatial data infrastructure (SDI) as:

"the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data"

GSDI Cookbook, 2009

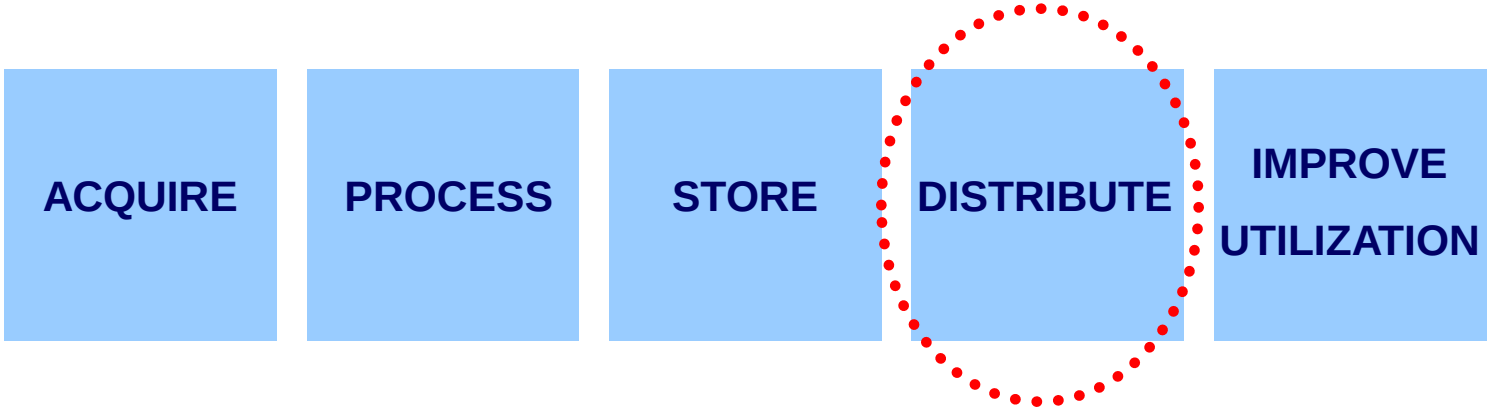
The definition originates from Federal Geographic Data Committee, 1994



The value chain

- A value chain describes the activities that adds value to the products produced by an organisation

- An example of a value chain - based on the definition of a spatial data infrastructure – can be defined by the following activities:



Maritime Spatial Data Infrastructure (MSDI)

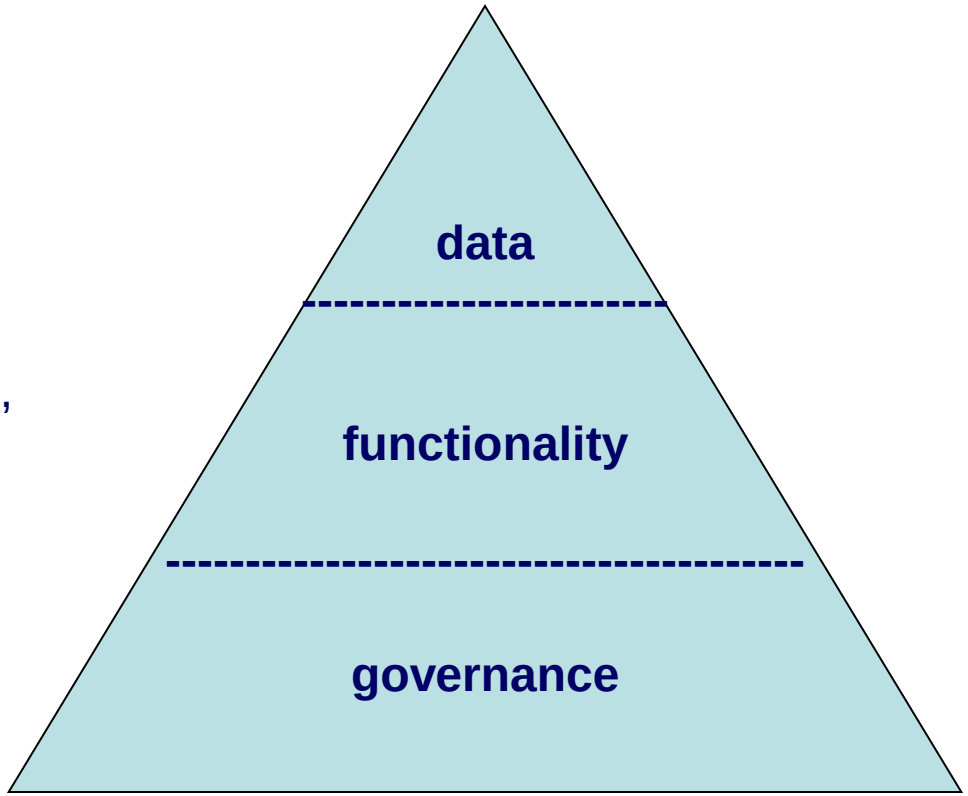
Geo Data of the Sea

Components of an infrastructure:

DATA - metadata, datasets

FUNCTIONALITY - spatial data services, web services and other technology

GOVERNANCE - Agreements and Organisation – rights and access

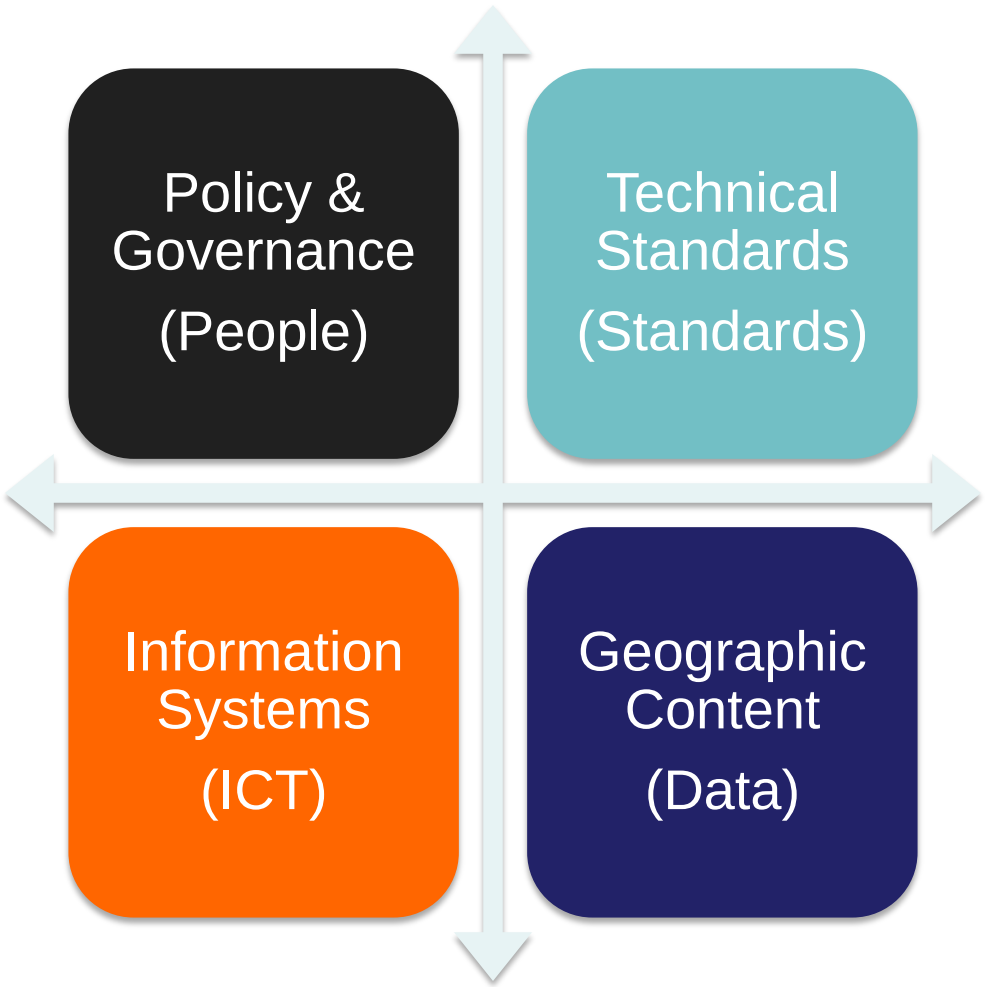


What is MSDI?

Stakeholders

Benefits

Funding



S-100

OGC

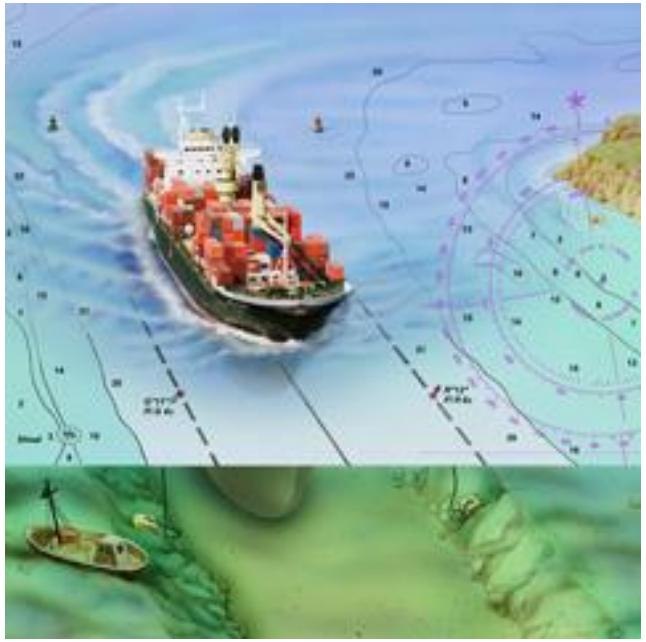
ISO

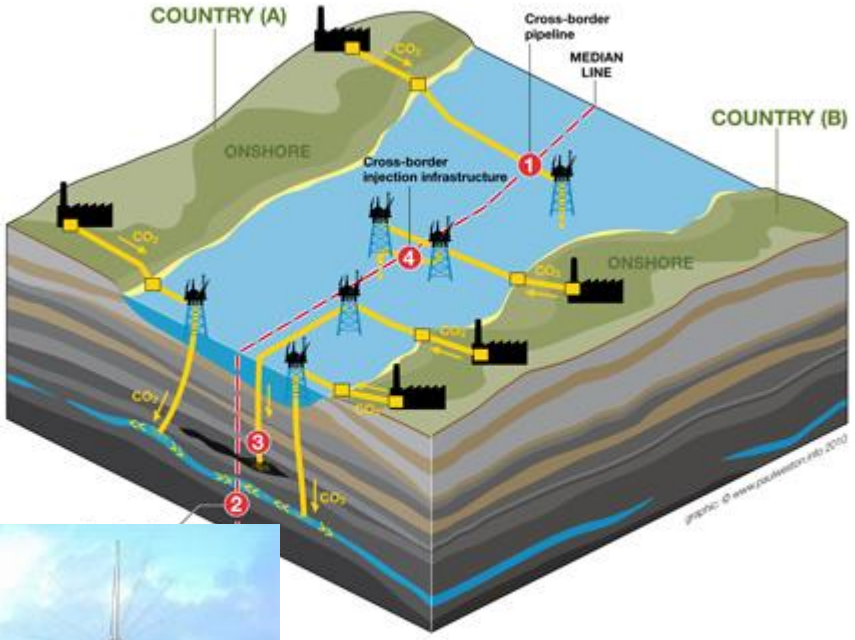
GIS

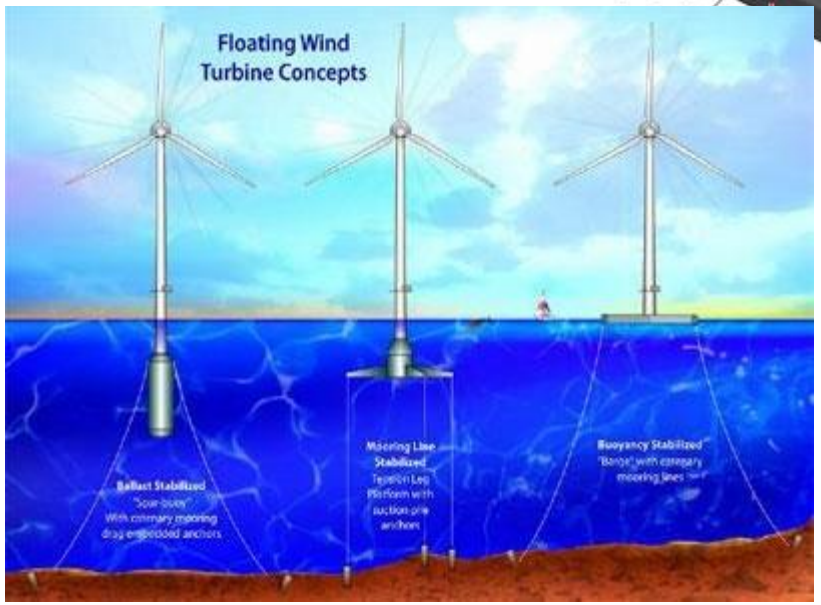
Internet

Data, not products

MSDI - Data




COUNTRY (A)
Cross-border pipeline
MEDIAN LINE
COUNTRY (B)
ONSHORE
Cross-border injection infrastructure
ONSHORE
CO2
1
2
3
4


Floating Wind Turbine Concepts
Ballast Stabilized
Mooring Line Stabilized
Buoyancy Stabilized

MSDI International – International Hydrographic Organisation (IHO)

IHO - MARINE SPATIAL DATA INFRASTRUCTURE WORKING GROUP (MSDIWG)

Objectives of the IHO MSDIWG:

- Identify the Hydrographic Community inputs to National Spatial Data Infrastructures (NSDI).

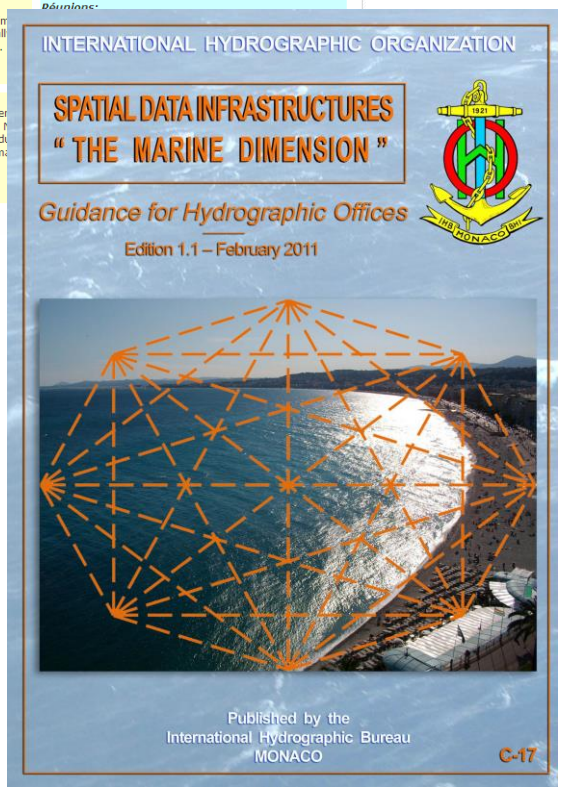
- Monitor national and international SDI activities

- Promote the use of IHO standards and member state marine data in SDI activities.

- Liaise, as appropriate, with other relevant technical bodies

- Propose any Technical and/or Administrative Resolutions that may be required to reflect IHO involvement in the support of SDI.

www.iho.int/srv1/index.php?option=com_content&view=article&id=483&Itemid=370



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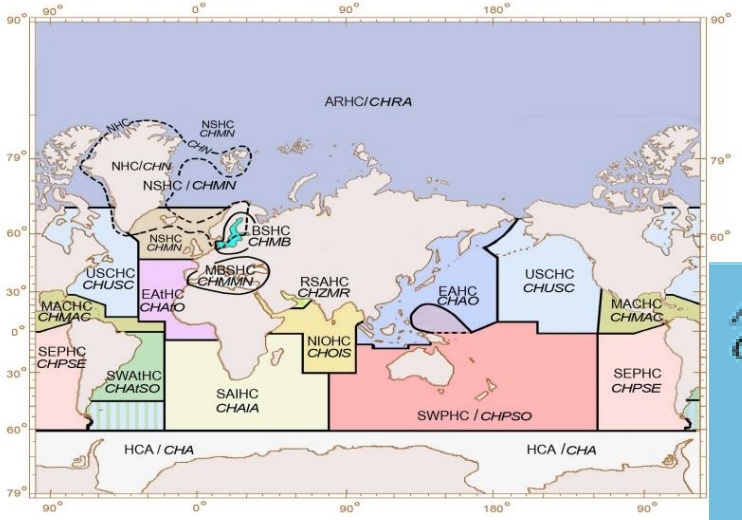
MSDI Regional

Baltic Sea Hydrographic Commission

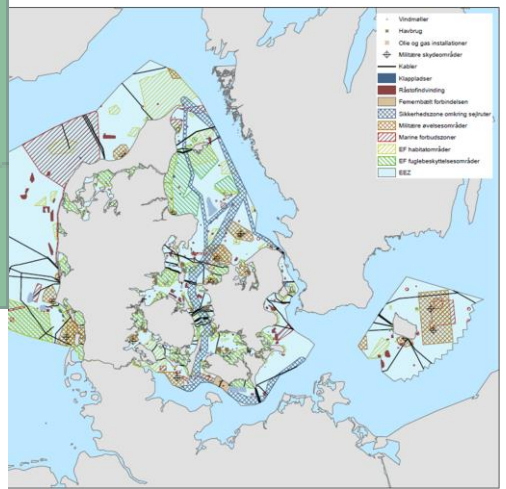
Baltic Sea MARINE SPATIAL DATA INFRASTRUCTURE WORKING GROUP (BSMSDIWG)

MSDI International



MSDI Regional

MSDI National



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The BSMSDI work plan:

Task	Work item	Milestones	Coordinator	Status
1	Hydrographic data and legal aspects	- Study and definition on hydrographic data under the respect of INSPIRE and MSP. - Definition of HO role in MSDI - Paper on BSHC MS contribute with relation to MSDI - Study on different laws with relevance to MSDI in the Baltic countries	Latvia Denmark	
2	Liaison with external projects	- Establish a list of MSDI relevant projects - Scanning of projects relevant for BSMSDI - Establishing a matrix with relevant projects	Germany	
3	S 100	- Conduct a study on S 100 - Evaluate on how to promote S 100 in the Baltic - Prepare paper to HSSC through BSHC - Evaluate the need for a pilot project	Germany Latvia	
4	INSPIRE	- Study on IHO standard S 57 in relation to INSPIRE - Study on legal binding compared to INSPIRE - The difference between S 57 and S 100	Estonia	
5	MSP and IZM	- Conduct a study on national approach to MSP - Prepare paper to HSSC through BSHC if needed - Evaluate the need for a pilot project	Denmark Latvia	
6	Common understanding	- Establish a framework for common understanding of MSDI	Latvia	
7	Technical solutions in the Baltic	- Study on the possibility to establish a BSHC metadata base - Study on MSDI impact on E-navigation and how MSDI can contribute to the implementation of E-navigation - Establishing use cases e.g. MSP, SAR, Environmental protection - Evaluate the need for updating BS MSDIWG ToR	Denmark Estonia Denmark	

Maritime spatial planning and integrated coastal management

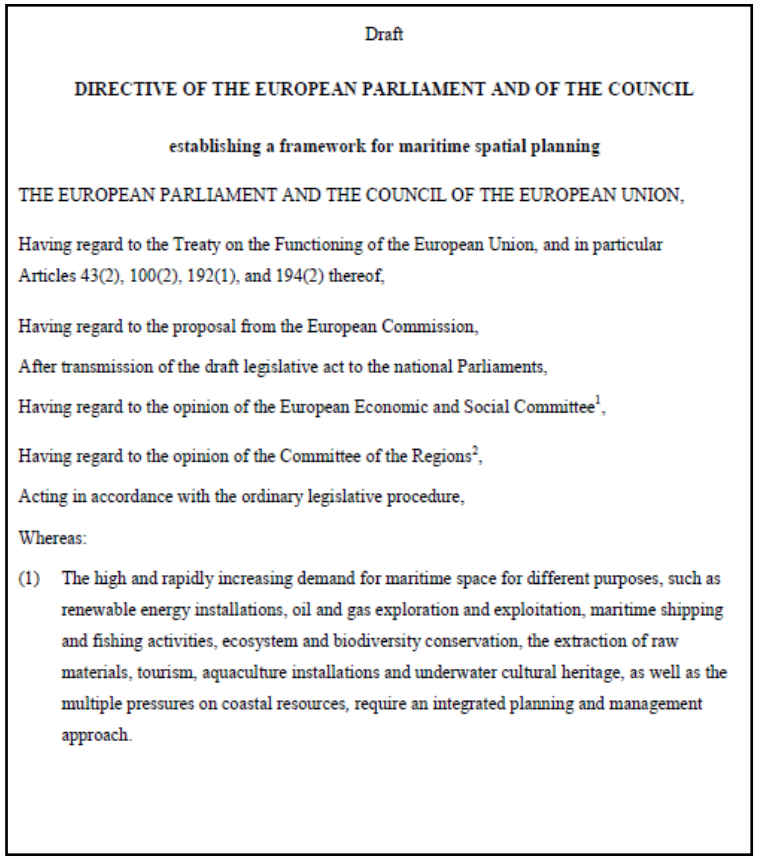
Article 6
Minimum requirements for maritime spatial planning

Member States shall establish procedural steps to contribute to the objectives listed in Article 5, taking into account relevant activities and uses in marine waters:

(e) **Organise the use of the best available data** in accordance with **Article 10**.

(f) **Ensure trans-boundary cooperation** between Member States in accordance with **Article 12.**

(g) **Promote cooperation with third countries** in accordance with **Article 13.**



Draft

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

establishing a framework for maritime spatial planning

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Articles 43(2), 100(2), 192(1), and 194(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national Parliaments,

Having regard to the opinion of the European Economic and Social Committee[1],

Having regard to the opinion of the Committee of the Regions[2],

Acting in accordance with the ordinary legislative procedure,

Whereas:

(1) The high and rapidly increasing demand for maritime space for different purposes, such as renewable energy installations, oil and gas exploration and exploitation, maritime shipping and fishing activities, ecosystem and biodiversity conservation, the extraction of raw materials, tourism, aquaculture installations and underwater cultural heritage, as well as the multiple pressures on coastal resources, require an integrated planning and management approach.

Article 8 (new)

Set-up of maritime spatial plans

1. When establishing and implementing maritime spatial planning, Member States shall set up maritime spatial plans which identify the spatial and temporal distribution of relevant existing and future activities, uses in the marine waters in order to contribute to the objectives set out in Article 5.

2. In doing so and in accordance with Article 2(3), Member States shall take into consideration relevant interactions of activities and uses. Without prejudice to Member States' competences, possible activities and uses and interests may include:

- **aquaculture areas;**
- **fishing areas;**
- **installations and infrastructures for the exploration, exploitation and extraction of oil, gas, mineral and aggregates, and other energy resources and the production of renewable energy;**
- **maritime transport routes and traffic flows;**
- **military training areas;**
- **nature and species conservation sites and protected areas;**
- **raw material extraction areas;**
- **scientific research;**
- **submarine cable and pipeline routes;**
- **tourism;**
- **underwater cultural heritage.**

What are the data-sets needed for maritime spatial plans?

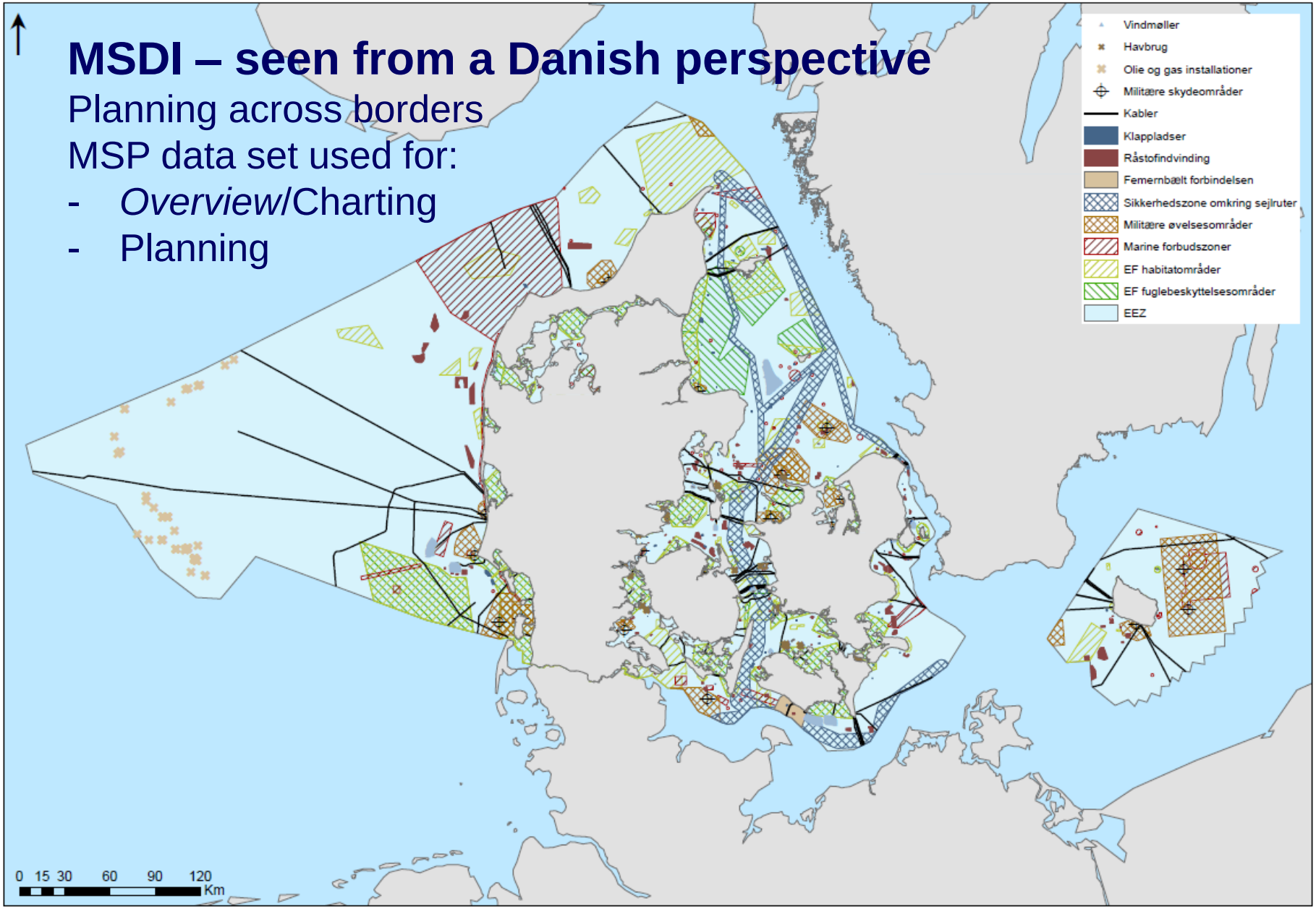
- Planning
- Overview/Charting

MSDI – seen from a Danish perspective

Planning across borders

MSP data set used for:

- *Overview*/Charting
- Planning



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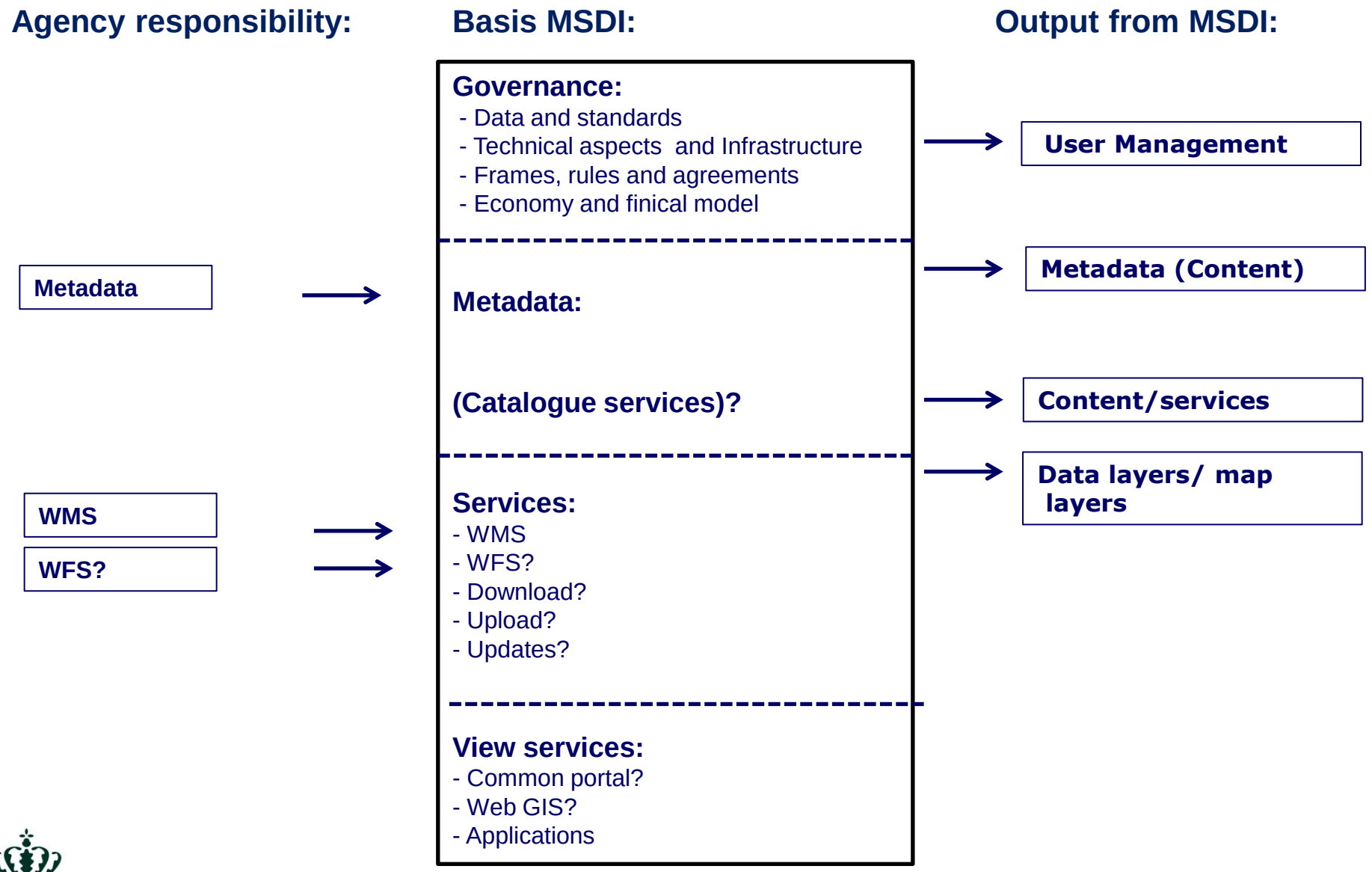
Draft responsibility in the Danish MSDI:



Presentations of data sets associated with MSDI and MSP

- Gives an overview of dataset needed for MSP
- More than 70 datasets identified
- Most of the dataset is covered by INSPIRE annex 1 to 3

	ID	Oplæg vedr. datasæt i forbindelse med MSDSI og MSP Interesser / Planlægningsemne (Nummeringen for planlægningsaktivitet)	P = planlægning K = kortlægning	Type af data (Punkt/Linje/Polygon/Tekst) - (Beskrivelse)	Dataejer	Brugere af Data (begrundelse)	Mulighed for træk fra databaser	Metadata	Ajourføring s hyppighed	Ajourførin gs årsag
6		**Akvakultur (nr. 6) (Havbrug inkl. muslingebrug og tanganlæg)**								
7	17	Havbrug	P	Polygon (information)	Naturerhverv	Bruges af FD m.fl.	Nej	Ja		
8	18	Muslingebrug	P	Polygon (information)	Naturerhverv	Bruges af FD m.fl.	Nej	Ja		
9	NY	Tanganlæg	P							
10		**Anlæg på havet**								
11	Ny	Anlæg etableret på søterritoriet med Kystdirektoratets tilladelser herunder (tanganlæg, Søfly-pladser, ledninger, vrag, bygninger, lystbådehavn, fortøjningsanlæg etc.)	K	Polygoner	KDI					
12	Ny	Kystbeskyttelsesanlæg (Kystbeskyttelseskonstruktioner herunder høfder, stenkastning, skråningsbeskyttelse,	K	Polygoner	KDI					
13	Ny	Kystfodringsstrækninger	K	Linjer/polygoner	KDI					
14		**Anlæg til udvinding af energi og produktion af vedvarende energi (nr. 1)**								
15	15	Havvindmøller (anlægs og produktionsoplysninger) (indtegnet i søkort)	P	Linjer (information)	ENS	GST Skibsfart m.m.	DB internet			
16	Ny	Havvindmøller (anlægs og produktionsoplysninger) I ENS GIS	P	Polygon (information)	ENS	GST Skibsfart m.m.	Energistyrelsens hjemmeside.			
17	Ny	Tilladelser - forunder-søgelse, etablering og tilslutning.	P	Tekst (information)	ENS	GST Skibsfart m.m.	DB internet			
18		**Fiskeri (nr. 5)**								
19	Ny	VMS data for fiskefartøjer over 12 m.	K		Naturerhverv					
20	16	Bundgarn	P	Linjer (information)	Naturerhverv	Bruges af FD m.fl.	Nej	Ja		
21	22	Fiskerigrænse bundgarn indtegnet i søkort	P	Linjer	Naturerhverv	GST, SFS, Skibsfart m.m.	Nej			
22		**Friluftsliv (nr. 11)**								
23	Ny	Lokale ordensreglementer og politivedtægter kan regulere forholdene i et område	P		Politi					
24		**Fælles forvaltnings data**								
25	14	DTM	K	Punkter, linjer	GST	SFS, GST Skibsfart m.m.	Kortforsyningen WMS, WFS	Ja		
26	Ny	DSM	K	Punkter, linjer	GST		Kortforsyningen WMS, WFS	Ja		
27	20	Nationale grænser (Normale rette basislinjer)	K	Linjer, polygoner	GST	Bruges af andre	Kortforsyningen WMS, WFS	Ja		
28	21	3, 12 og 24 sømilegrænse	K	Linjer, polygoner	GST	Bruges af andre	Kortforsyningen WMS, WFS	Ja		
29	25	KORT10	K	Punkter,linjer,polygoner,tekst, (informati	GST	Bruges af andre	Kortforsyningen WMS, WFS	Ja		
30		**Havne (nr. 12)**								
31	Ny	Havnenes placering (fiskerihavn, erhvervshavn, lystbådehavne inden for samme havneområde)	K	Polygoner	KDI ?					
32	Ny	Havnegrænserne på søterritoriet	K	Polygoner	KDI ?					
33	Ny	Dybder i havnebassinerne	K		KDI ?					
34	Ny	Udviklingsplaner for havnene, herunder forventet	K	Polygoner	KDI ?					

Kystdirektoratet
Danish Coastal Authority

SØFARTSSTYRELSEN

STYRELSEN

Miljøministeriet
Naturstyrelsen

MILJØMINISTERIET
Miljøstyrelsen

Ministeriet for Fødevarer, Landbrug og Fiskeri
NaturErhvervstyrelsen

Danish Ministry of the Environment
Danish Geodata Agency

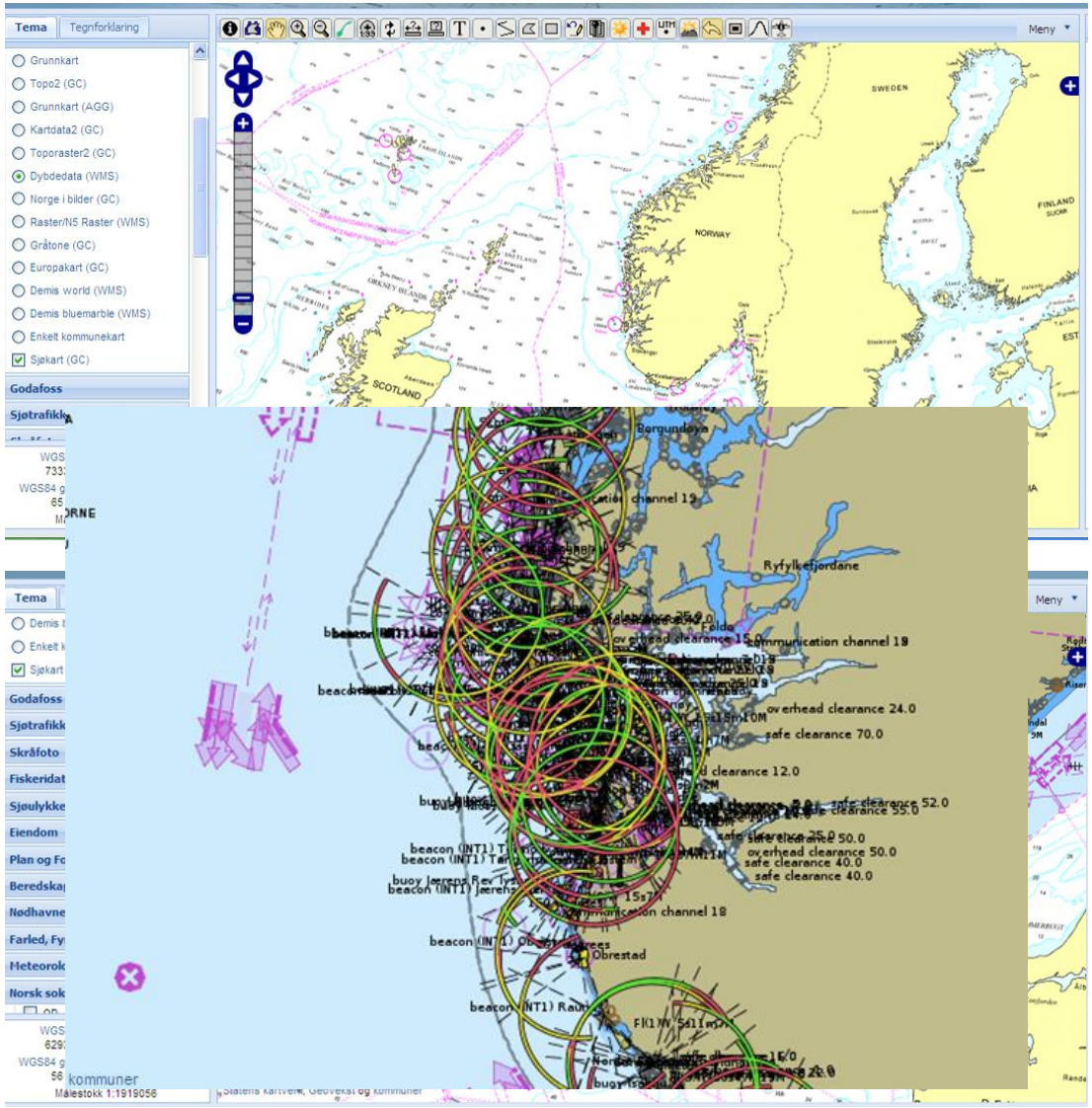
ENERGI STYRELSEN

Søværnet
Søværnets Operative Kommando

Hydrographic data and its role in MSDI

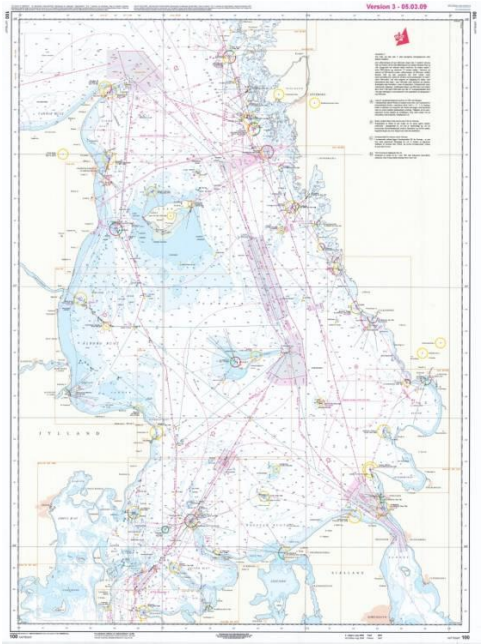
Deliverables I GIS:

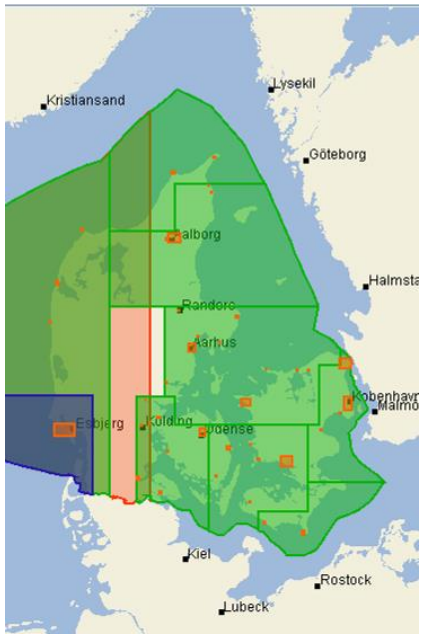
- Raster charts as background map
- ENC - S57 data as additional layer
- Hydrographic data sets



MSDI data sets

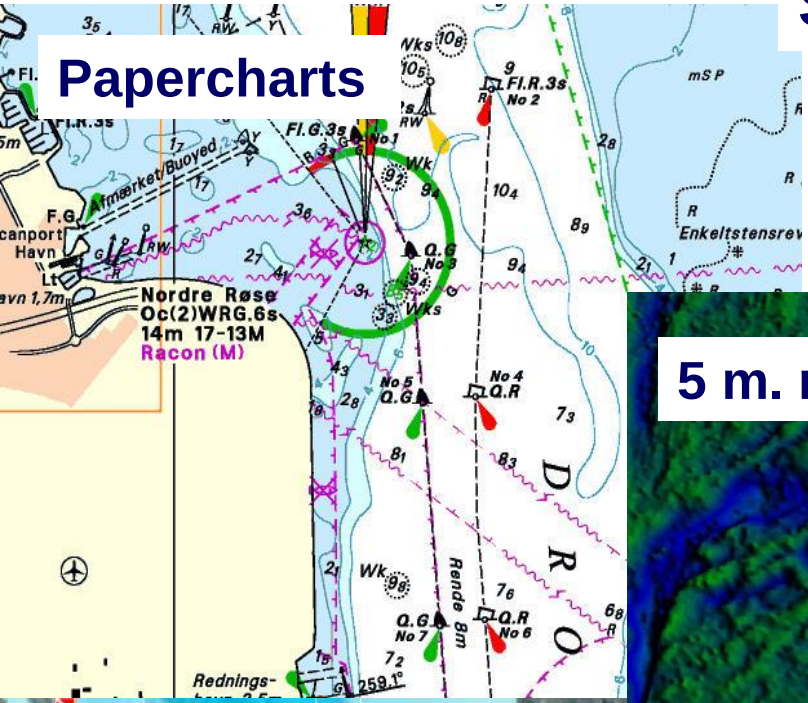
- **The legal rights of the owner of data sets**
- **The need for a national/regional/international governance model**
  - Interoperability can only be ensured through clear agreements between contributors
  - National security issues
  - National constructions differ in terms of rights and responsibilities regarding marine data.
- **A clear definition of hydrographic data sets**
- **Definition of key hydrographic data set**



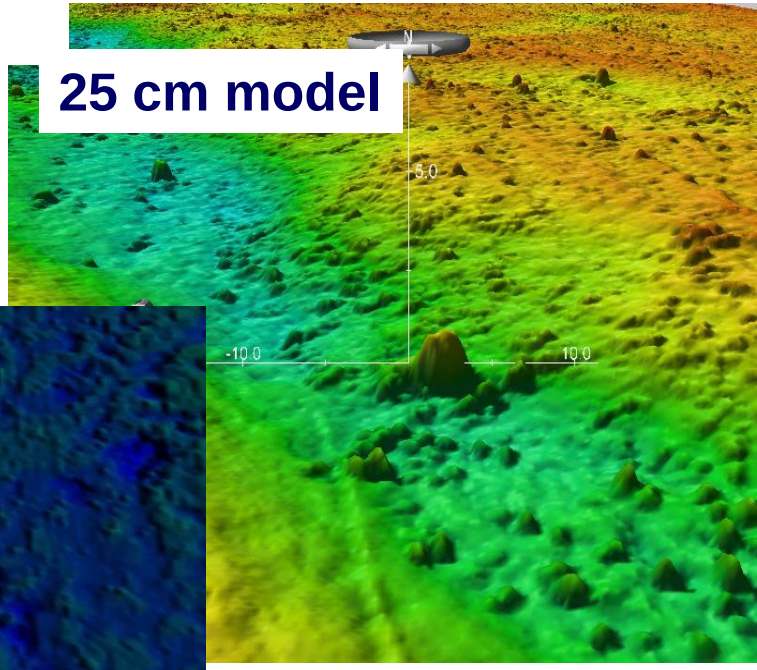


Surveying

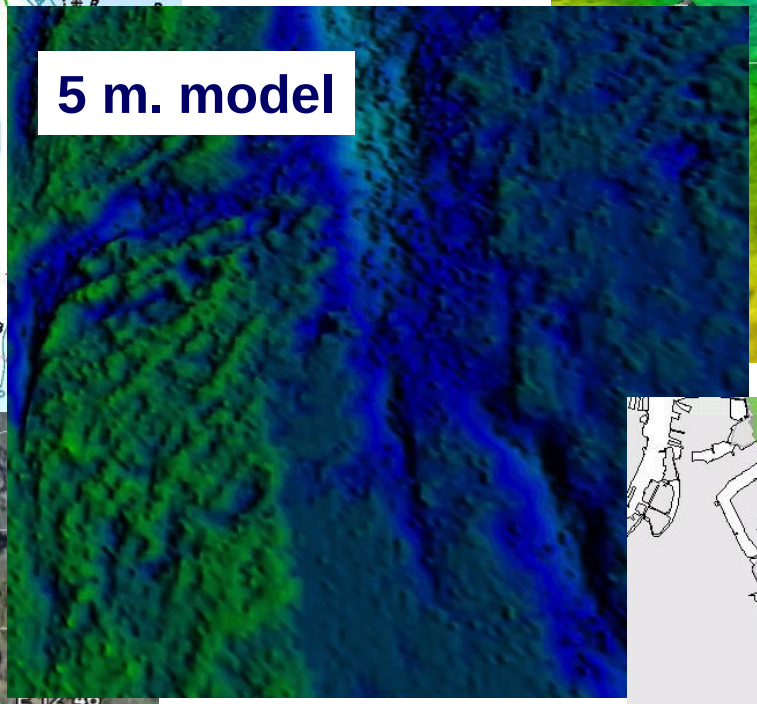
Papercharts



25 cm model



5 m. model

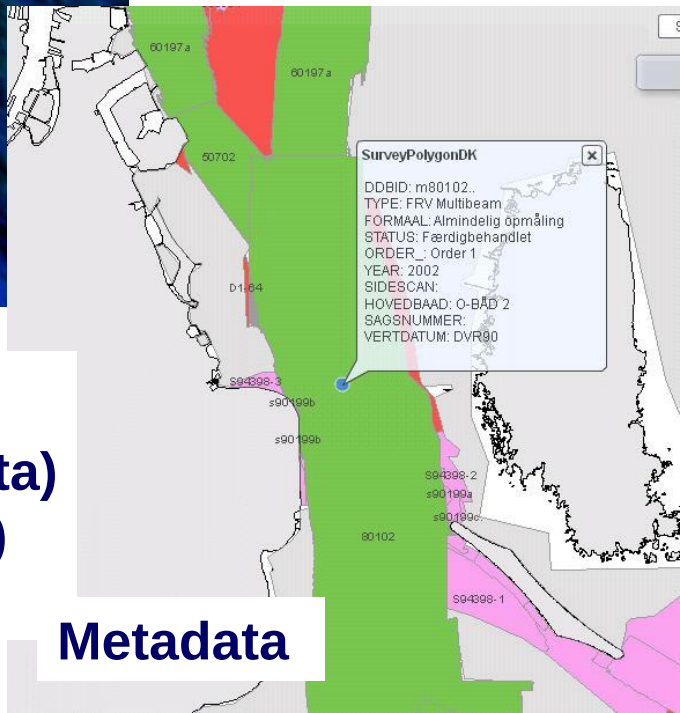


50 m model

Challenges:

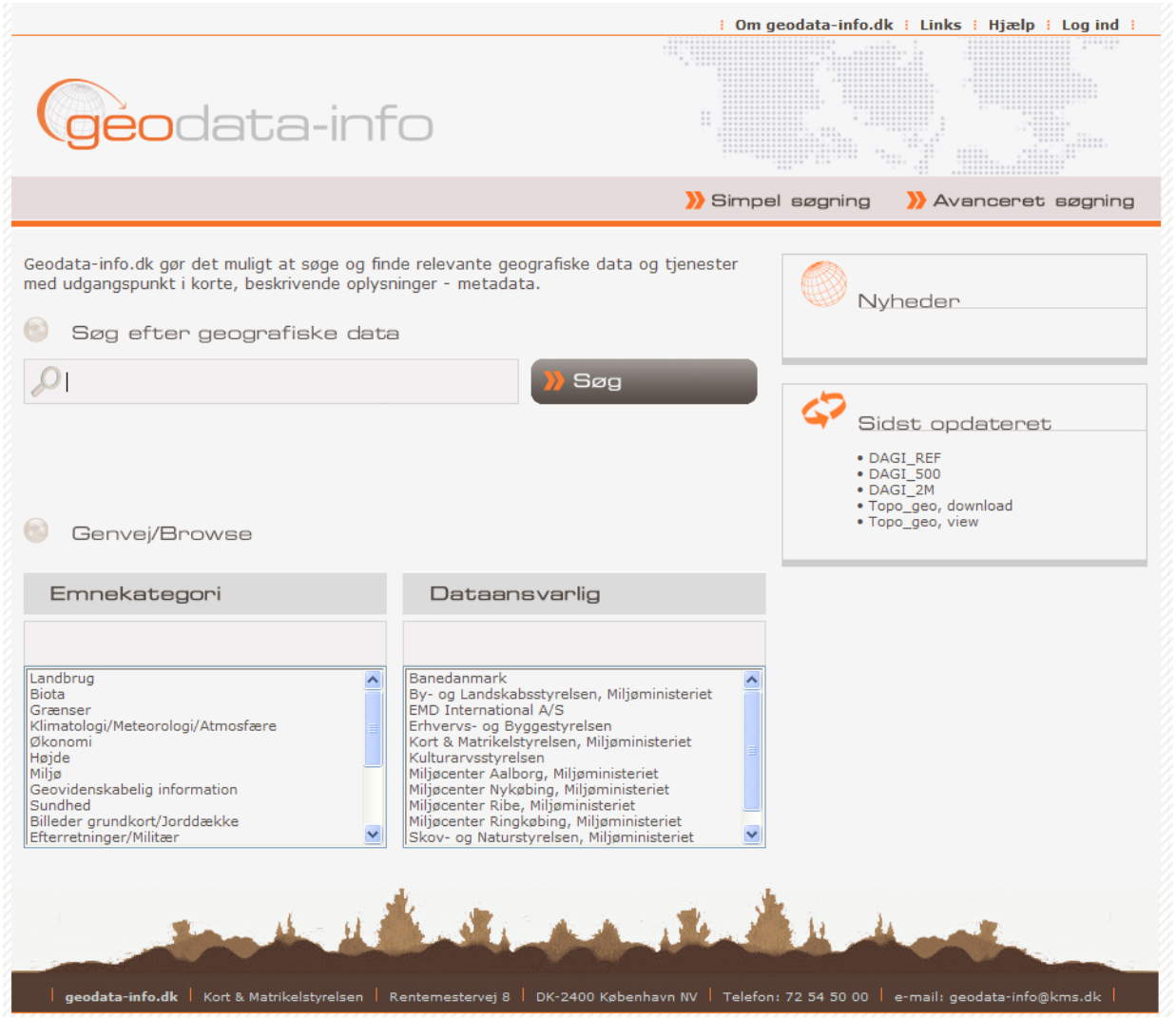
- Storages (Raw data)
- Quality (Metadata)
- Harmonisation

Metadata

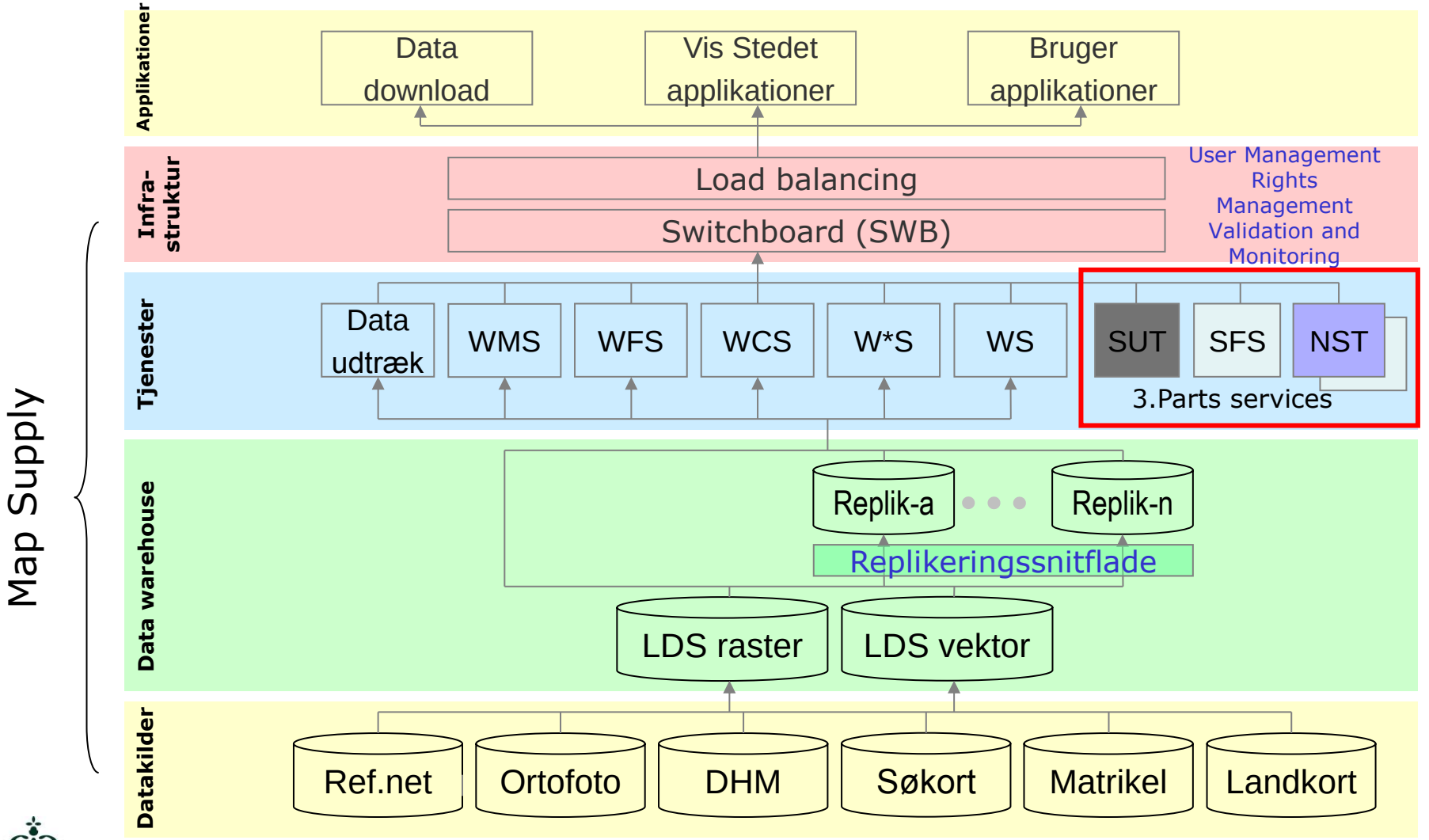


Metadata and Catalog services:

Geodata-info as the official approach to metadata and catalog services for the MSDI.

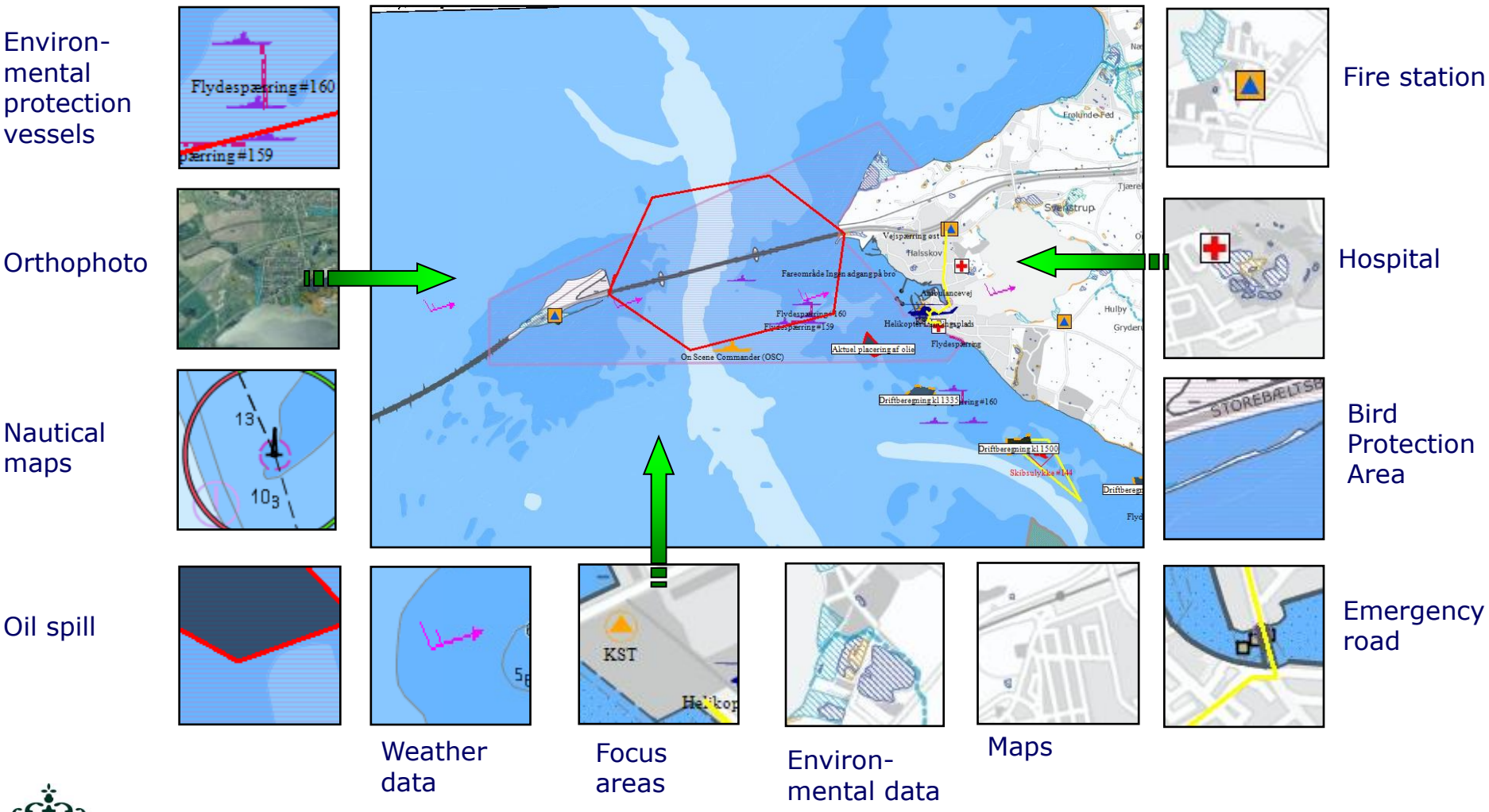


Services:
The Danish Map Supply - Overall architecture



MSDI - Creating a Common Operational Picture

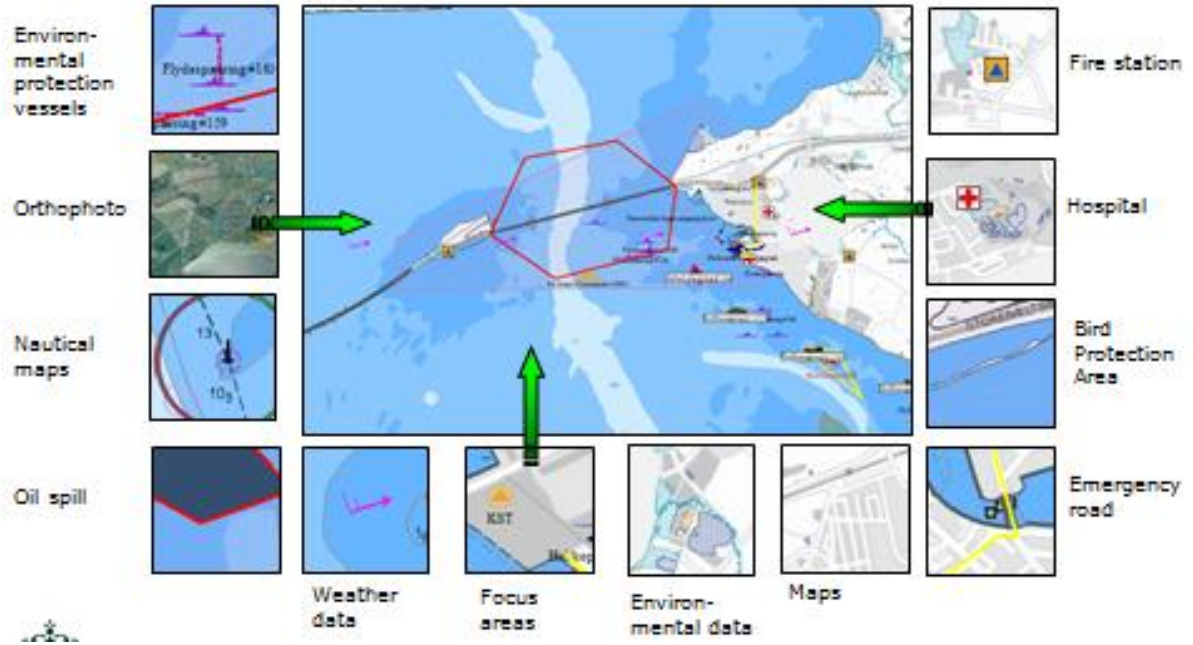
MSP - SAR - ICM – Environmental protection - Surveillances - VTS - MAS



Developing your marine spatial data infrastructure

Creating a MSDI for a Common Operational Picture:

- Definition of different use cases
- Knowledge about data and data providers/owners
- The right Information => dataset
- Knowledge about dataset => metadata
- Access to data when needed
- Quality of data
- Specific datasets should be updated, by the data owner
- Governances



MSDI – seen from a regional perspective

Consideration – the need for:

Planning across borders:

- Planning across sectorial interests
- Planning across sea/land (coastal zone)
- Focus on establishing a Common Operational Picture : (E.g. MSP, Nature and environment, SAR)
- Accessibility for citizens, firms and organizations
- Supporting digitisation among maritime authorities

The challenges:

Governance:

- Agree on the data-sets that should be exchanged, quality and standards
- Agree on the technical aspects, enabling the exchange of data-sets
- The organisation of regional MSDI, e.g. rules, and agreements
- Ensure coordination between, different regions and initiatives
- Economy and finical model
- Establishing Metadata


PRESENTATION
CONCLUDED