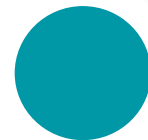


# National Report of Denmark

24th Baltic Sea Hydrographic Commission Conference  
10-12 September 2019 – Gdańsk, Poland



# Items

- Surveys – new ships
- New ship route system in the Skagerrak and Kattegat
- Greenlandic Chart Production
- New Production System
- MSDI business Case
- Free data analysis

# Surveys





<https://www.youtube.com/watch?v=1hK0N3JMdMY#action=share>



# New ship route system in the Skagerrak and Kattegat



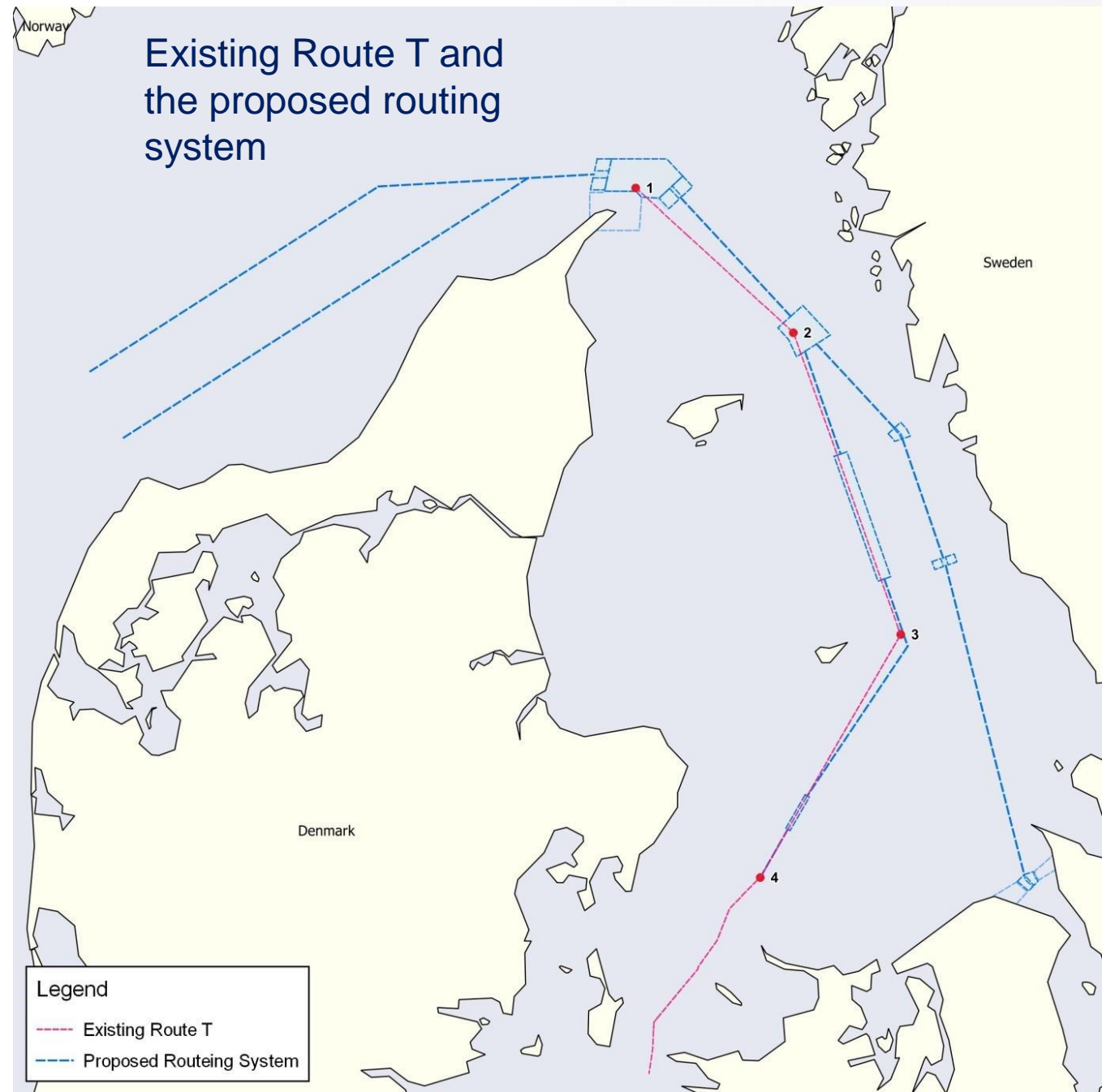
- Under today's conditions of navigation in Skagerrak and Kattegat ship traffic face unnecessary challenges without any assisting routing systems.
- Denmark and Sweden have developed new routing measures
- This will lead ship traffic via new routes that will guide and separate two-way ship traffic better than today and thus make navigation considerably more predictable and safe.

Reference:

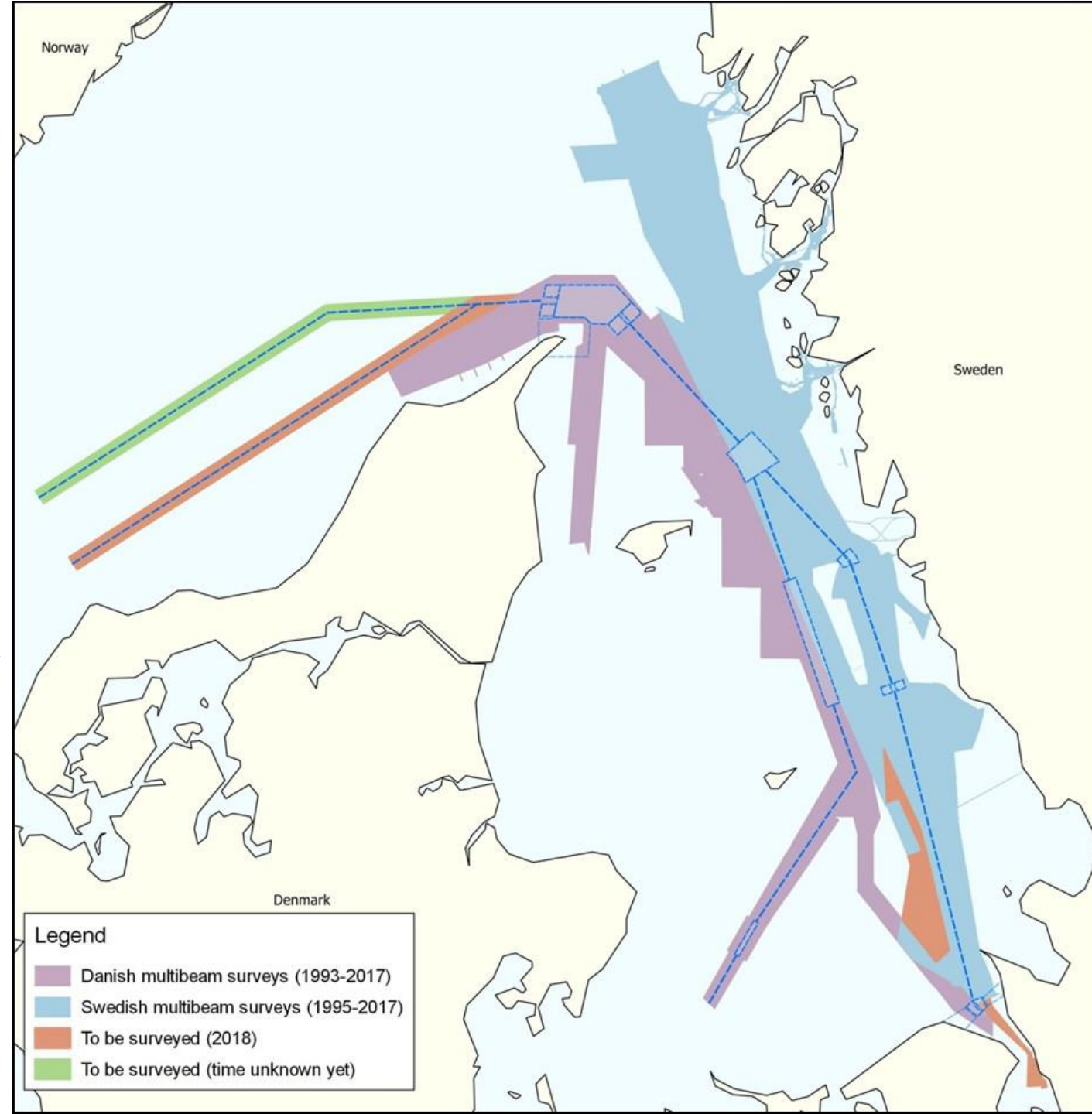
IMO NCSR 5/3/3

IMO NCSR 5/3/4

IMO NCSR 5/3/5



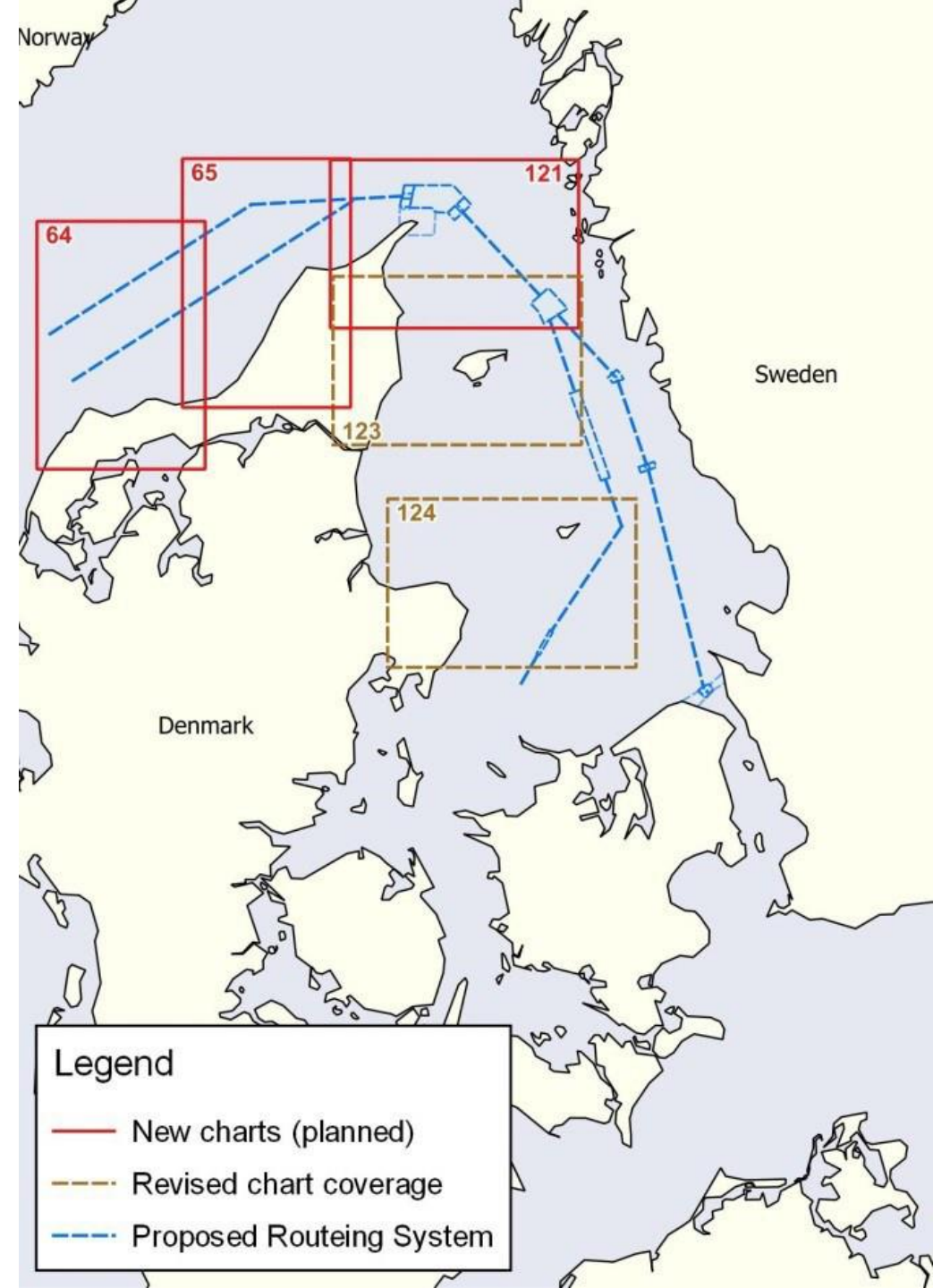
- Recommended route B has been surveyed in 2018.
- Recommended Route A will be surveyed in 2019.
- Hydrographic information will be updated in existing and new paper and electronic charts covering Skagerrak upon completion of the surveys.
- The implementation date of the routeing measures will be 1 July 2020.





DGA are making new ENC's in Coastal Band (DK3) with 30 and 50 m depth curves.

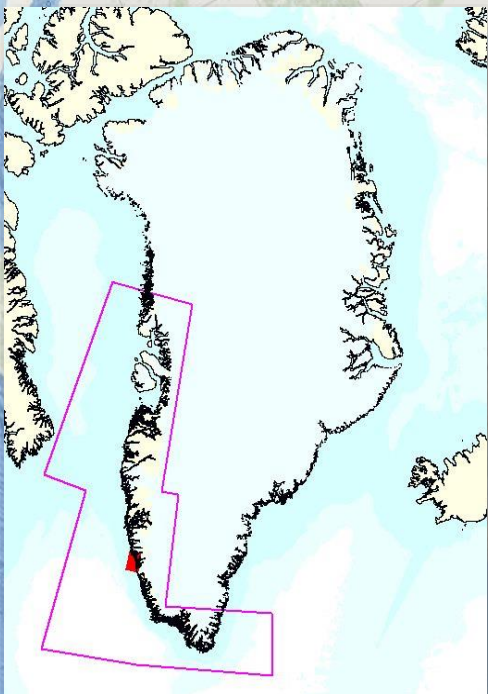
DGA are making 3 new charts in 1:100.000 and adjustment of chart 123 and 124 also in 1:100.000.





# Greenlandic Chart production

# Chart production in Greenland – New agreement with Greenland



## Grønland og Danmark reviderer samarbejdsaftale om søkort

Publiceret 30-08-2017

Nyhed

Naalakkersuisut (Selvstyret) og Energi, Forsynings- og Klimaministeriet underskriver hensigts erklæring om en revideret plan for søkortlægning i Grønland.



Energi-, forsynings- og klimaminister Lars Chr. Lilleholt sammen med sin grønlandske kollega Naalakkersuisoq for Kommuner, Bygder, Yderdistrikter, Infrastruktur og Boliger, Erik Jensen.

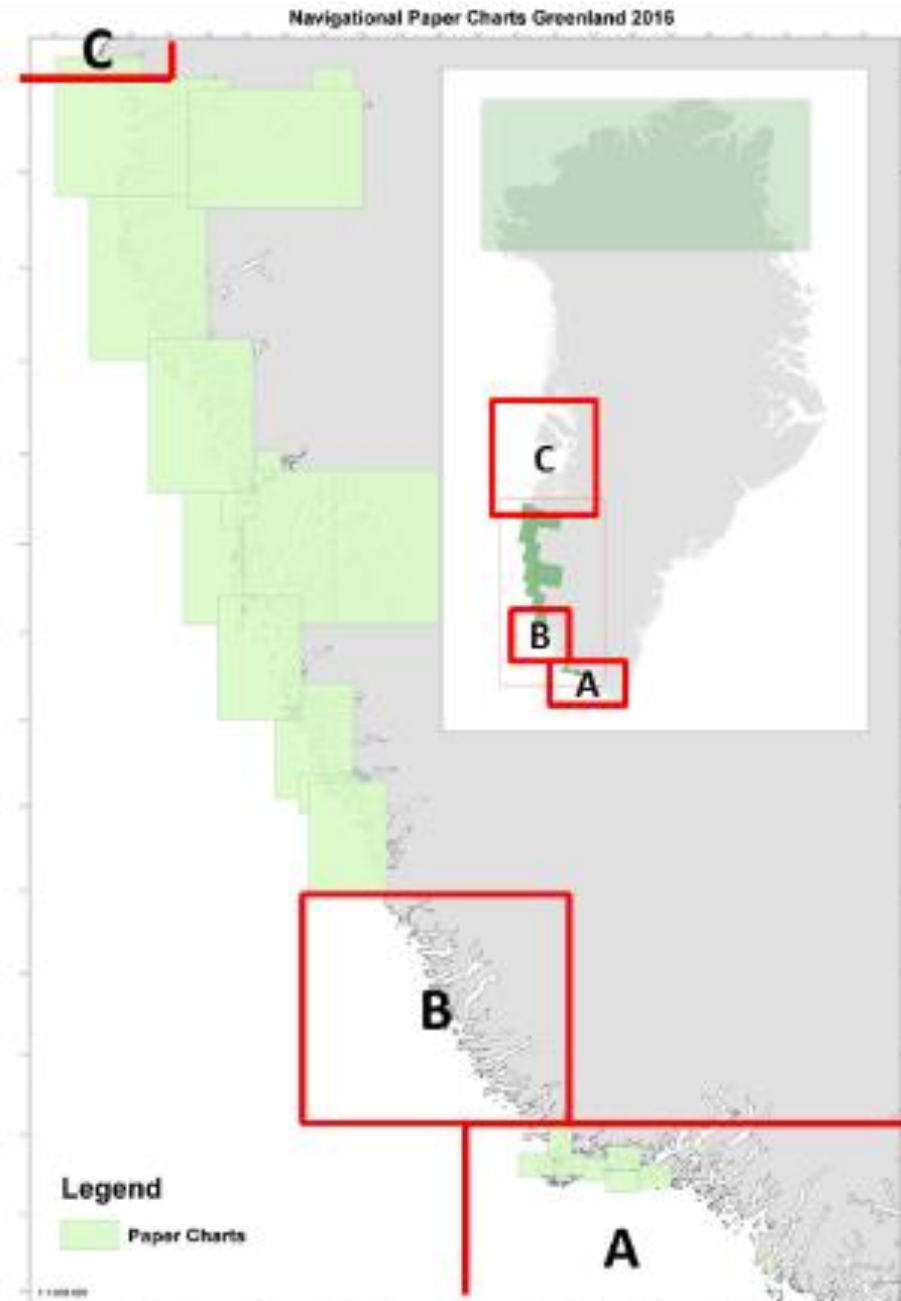
Den reviderede samarbejdsaftale indebærer blandt andet, at parterne forpligter sig til at udarbejde en ny produktionsplan for de grønlandske søkort inden udgangen af 2018, ligesom der igangsættes en række aktiviteter til gavn for den maritime udvikling i Grønland.

Denmark: 105.000 km<sup>2</sup>

Greenland: > 2.000.000 km<sup>2</sup>



# New production plan for Greenland Paper Charts



Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Planned yearly production rate	2	3	4	6	6	6	6	6	2
Planned – accumulated	34	37	41	47	53	59	65	71	73

## Prioritization list according to agreement with Greenland

- Possible Mining projects in area A
- Areas with unpublished new multibeam data
- Charts are produced in clusters according to area – Safety of Navigation & efficiency.
- Charts in best scale has first priority.
- ENCs & papercharts are produced at the same time.

3 charts planned in 2019

# New Production System

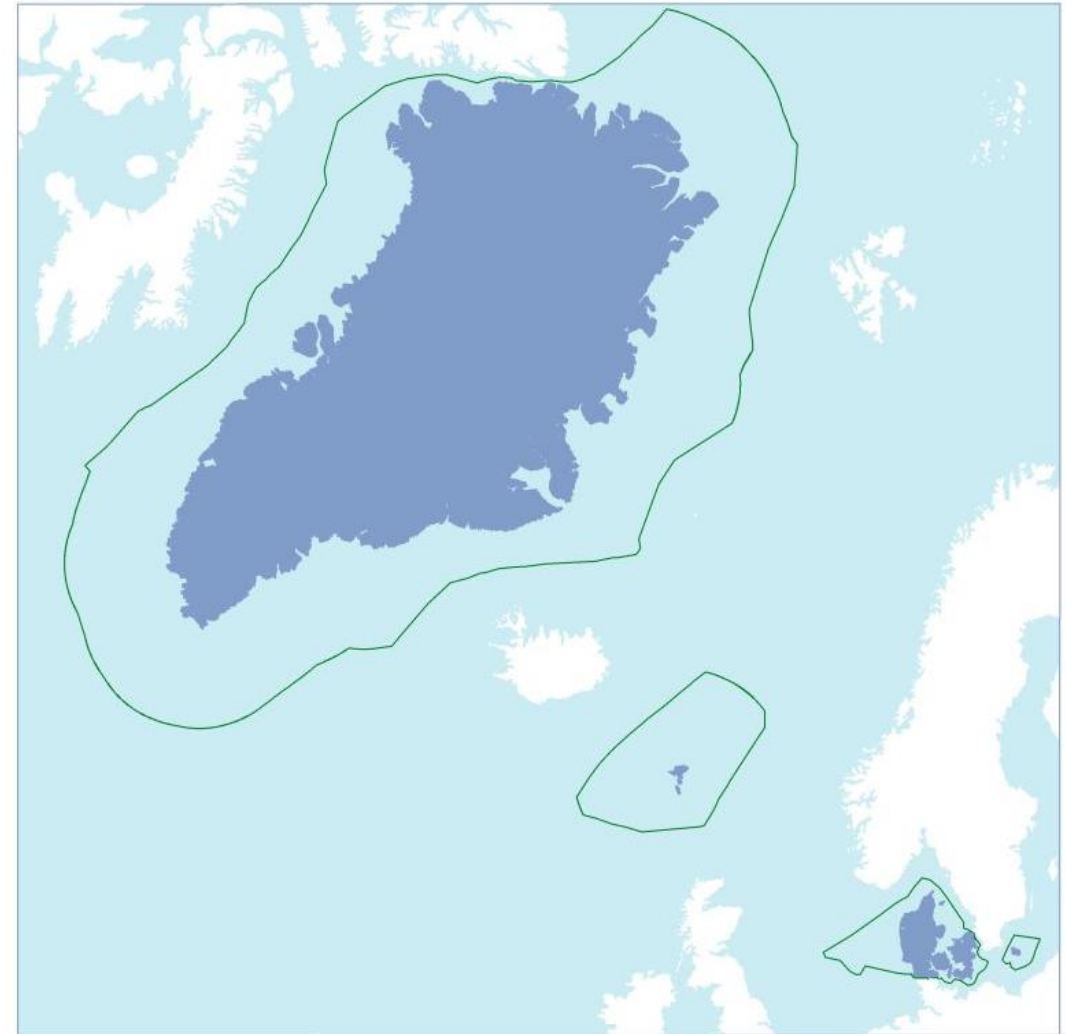


# Background for a new production system in GST

- Today GST has two separate production lines and use two separate production systems – one file-based and one database-based
- GST wishes to have one single, data-centric production system for ENCs and paper charts

# Main goals for a new production system in GST

1. One production system for ENC's and paper charts for all of GST's geographic areas
2. An efficient production system, where redundancy and manual steps are minimized
3. A production system prepared for a data driven production flow



# Scope of the NCPS project

- A fully installed, configured and operational Nautical Chart Production Environment comprising:
  1. Development and Education system
  2. Production System – manage incoming data sources, store and clean data, production and updates for ENC and paper chart, workflow management

# DGA has choosen Esri ArcGis for Maritime because...

- ESRI has a system that can produce ENC, Paper Charts and related products both on a short term and a long term perspective
- ESRI has some further possibilities, which we find fit into the strategic ideas we have for the future production i.e. :
  - An open datastructure og possibility for analysis of data
  - A possibility to use the same platform for all our production processes
  - A possiblity to reduce the amount of "hand hold" data, which reduces the risks of errors and can make our work flows more siple and more effective
- DGA has experience with the system already



# Deliverables

- Installation and configuration of the system
- Data migration
  - Danish waters
  - Faroe Island waters
  - Greenlandic waters
- Training
- Configuration of workflows



# Milestones

- Design and planning phase until June 2019
- Implementation phase June – December 2019
- Production and Final acceptance of the Delivery phase Jan – April 2020

Project expected to end June 2020

# MSDI Business case

# Danish MSDI – Business case

Today the Danish MSDI are only accessible for the 11 marine authorities that participated in development of the MSDI.

Business case: *Benefits of and costs associated with the further development of the MSDI*

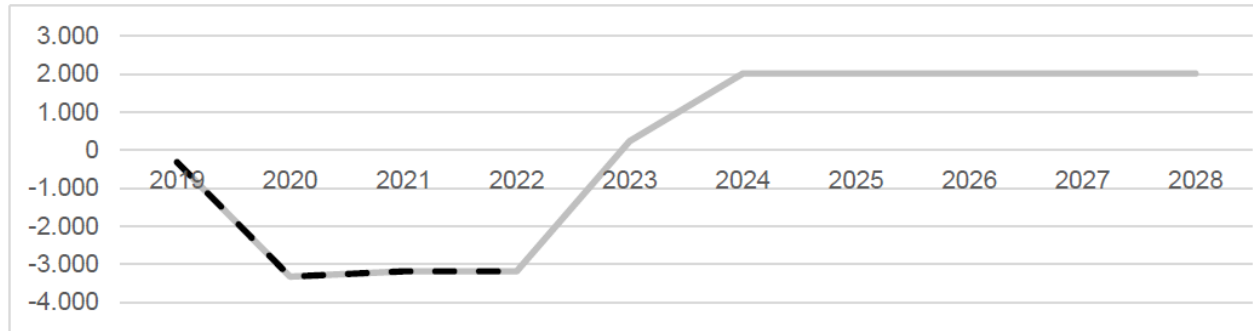
## Three-step development plan

1. Open MSDI solution for all, e.g. authorities, businesses and citizens
2. Introduce more marine data
3. Enhanced technical solution with tools and time-series data.



	Step 1. Open basic MSDI solution for authorities, businesses and citizens	Step 2. Introduce marine data – new data for multiple users and multi-use purposes	Step 3. Enhanced technical solution with new data and tools for authorities
Description	<ul style="list-style-type: none"> <li>Open basic MSDI solution that is accessible to authorities, businesses and citizens</li> <li>Portal containing information and geographic maps as well as links to data sources and descriptions</li> <li>Full access to current themes which are available to the general public</li> <li>Still possible to include sensitive data which are not accessible to the general public - only to authorities</li> </ul>	<ul style="list-style-type: none"> <li>More data in an open basic MSDI solution that will be displayed by authorities</li> <li>Data can be downloaded directly from the data owner (from the different authorities)</li> <li>New data themes targeted at businesses and authorities, including agreements with new data providers</li> <li>Improved description of themes and their applicability</li> <li>Initiate procurement of an extended technical solution</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced technical solution for the portal, GIS, application and database entailing improved security and reliability of data supply</li> <li>Several new themes and agreements with new data providers, including time-series data and data targeted at citizens and associations</li> <li>Will allow for the use of themes by additional users, e.g. local authorities, for the purposes of climate-change adaption and combined physical planning (land-sea)</li> </ul>
Benefits	<ul style="list-style-type: none"> <li>The authorities can use MSDI to communicate new guidelines and decisions.</li> <li>Other users will benefit from improved access to data. The technical specifications put limits on the benefits at this point.</li> </ul>	<ul style="list-style-type: none"> <li>Improved downloading services increase the benefits for all potential users and allow for the development of services based on the MSDI solution and the integration of these into the potential users' own systems</li> <li>The improvement from additional data and analyses increases the potential benefits</li> <li>Increase in the number of potential users – all new data imply new potential users/benefits</li> </ul>	<ul style="list-style-type: none"> <li>Increased focus on extending the use of the MSDI solution will result in the identification of new users and increase the potential benefits</li> <li>Time-series data have been in great demand</li> </ul>





## Danish MSDI – Business case

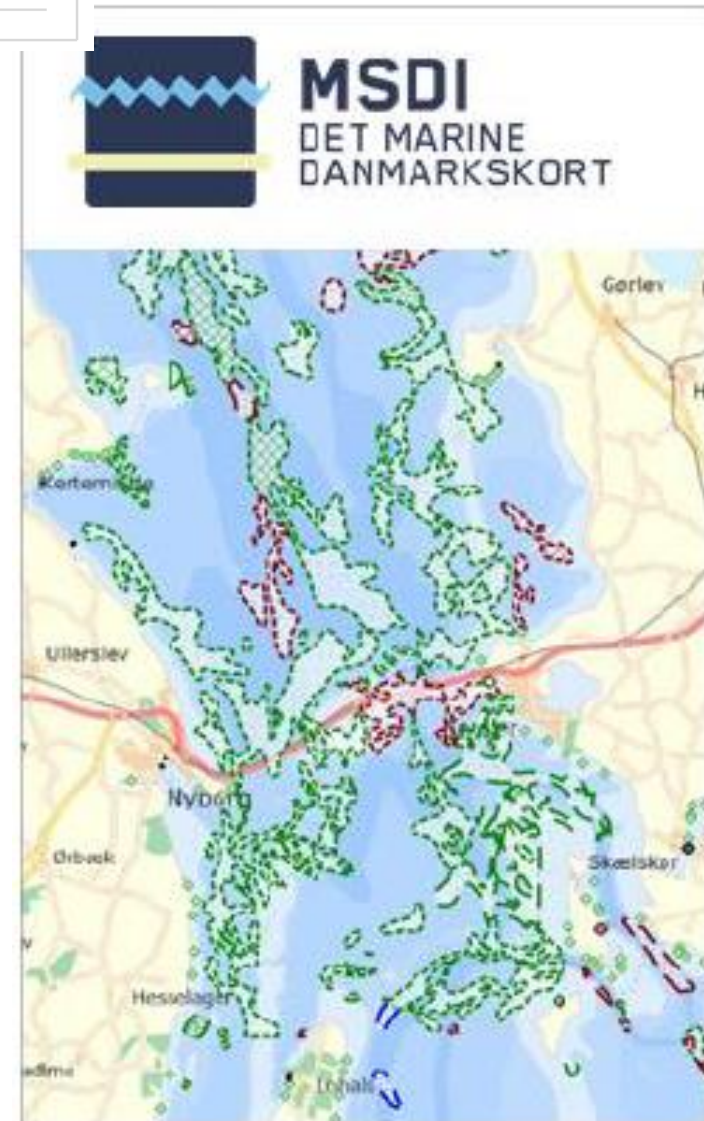
An **important step** towards realising the Danish Government's growth plan for 'The Blue Denmark'

Indicated a **strong demand** for a further development of the Danish MSDI as a free and open data infrastructure for marine data

Showed an **annual net benefit of DKK 2 million (€ 0.27 mio)** after implementation of the three-step development plan and a positive net value over an 8 year period. Implementation costs around DKK 7.1 million (€ 0.95 mio).

Several **qualitative benefits**, e.g.

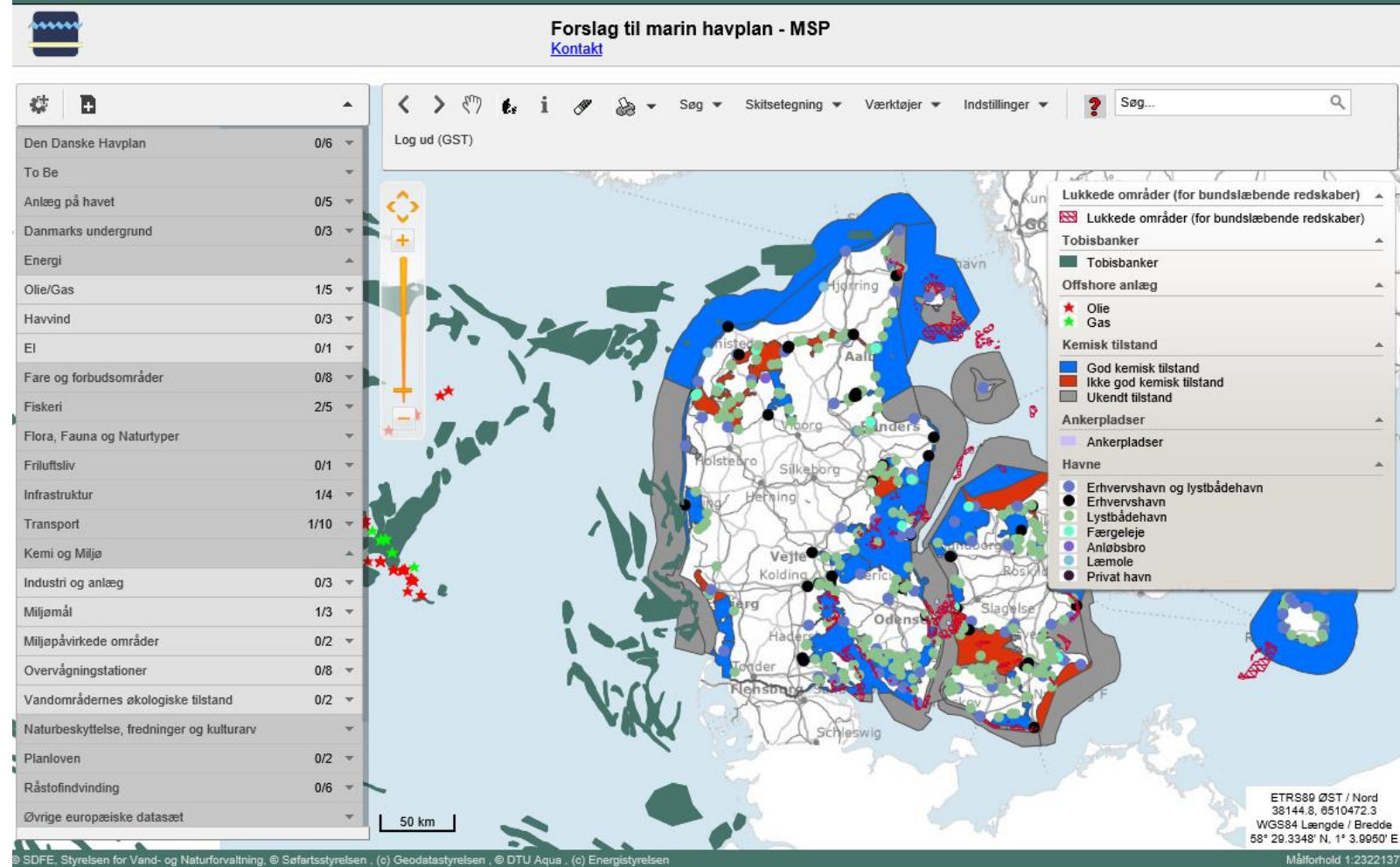
- improving authorities communication of decisions, rules and guidelines
- new business opportunities for entrepreneurs
- improved data accessibility for research
- improvement of recreational apps and maps aimed at citizens.



# Danish MSDI

## Specific profiles

- Requests from marine authorities
- Separate profiles with selected datasets which are relevant to a specific task
- Only access for working group members, whereby confidential GIS-dataset can be shared within the group
- Currently two profiles: Marine Spatial Planning and Marine Strategy



## Examples of datasets

- **Sustainable Energy**, e.g. Windmills; Oil and Gas
- **Protected Areas**, e.g. Nature Reserve, Restricted Areas, Dumping grounds
- **Environmental Data**, e.g. Water Quality; Hazardous Substances; Flora and Fauna; Sediment

# Free data analysis



# Great potentials from free hydrographic data

Free hydrographic data is associated with great potentials from both a welfare economic, environmental and financial perspective



## **Welfare economic benefits**

- Improved safety at sea – and lower costs to sea rescues and insurance
- Improved quality of sailing
- Increased sailing tourism



## **Environmental benefits**

- Better flood forecasting
- Research, e.g. within marine spatial planning
- Reduced fuel consumption – due to better route planning and loading



## **Financial benefits**

- Increased turnover – both from improved quality of existing products and services and new products
- Effectivization, e.g. due to better planning tools





# Benefits amounting to 145 million DKK

A business case from Deloitte assess that there is a direct economic potential within three sectors amounting to 145 million DKK over a three year period – primarily driven by the availability of detailed depth data



## Commercial sailing

- Increased turnover in services based on new and more advanced route planning models



## The energy sector

- Reduced costs of offshore installations due to better data to be used in the screening and planning phase



## Data companies

- Increased turnover in companies providing services and products related to navigation and route planning – and reduced costs of input factors

## What will be included?

- Raster charts (paper charts)
- Vector charts (un-encrypted S-57 data)
- Bathymetric models (depth data)
- Publications

*ENC's not included*

## What does it take?

- Investment in development of a bathymetric model
- New business models (from royalty agreements to public funding)
- Change in distribution channels – more efficient distribution to the public
- Enhanced surveying and/or data collection – especially for shallow waters