Agenda item B3.1.

23rd Baltic Sea Hydrographic Commission Conference
27-29 August 2018 – Aalborg, Denmark

National Report of Denmark
July 2018

Executive summary
This report gives a summary of the main activities within the Danish Hydrographic Office since the last report given at the BSHC22 meeting in Rostock, Germany, 19 – 21 September 2017

1. Hydrographic Office
The present report outlines and sums up the activities carried out by the Danish Geodata Agency (DGA), with special focus on its hydrographic activities since last BSHC meeting.

The Danish Geodata Agency is part of the Danish Ministry of Energy, Utilities and Climate. The Ministry consists of the Department, the Geological Survey of Denmark and Greenland, the Danish Meteorological Institute, the Danish Energy Agency, the Danish Geodata Agency, the Danish Energy Regulatory Authority, Energinet.dk and the Agency for Data Supply and Efficiency.

DGA has been situated in Aalborg from November 2016 and have approximately 120 employees; the agency is responsible for cadastre and hydrography including the role as the Danish Hydrographic Office.

Internal structure in the Danish Geodata Agency

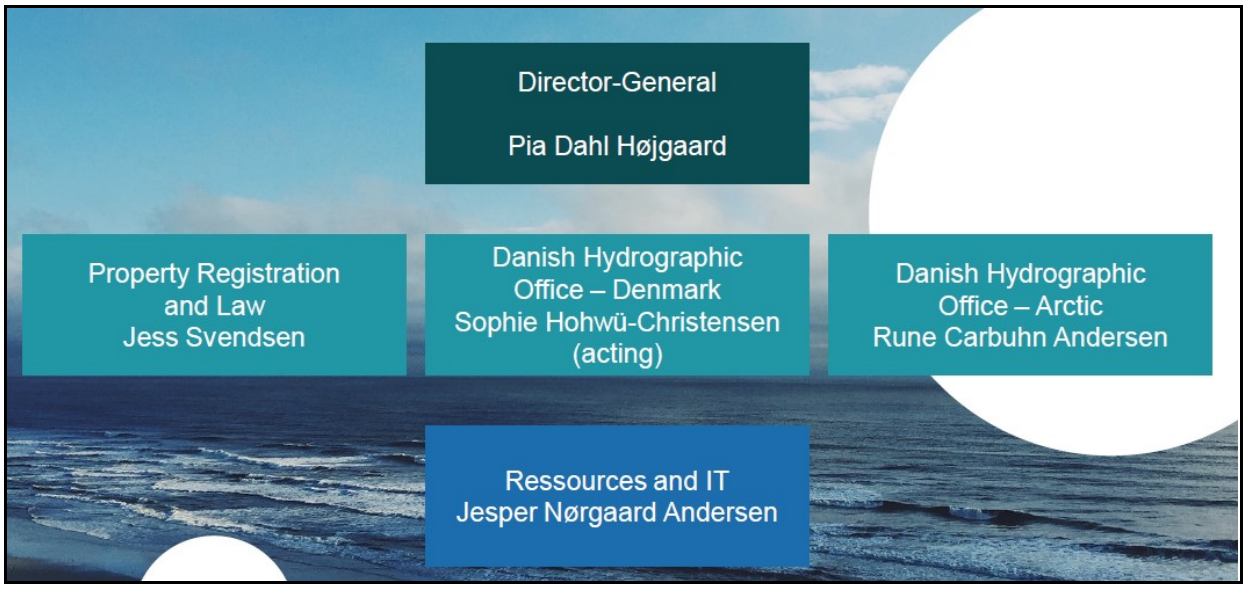

Figure 1. The internal structure of the Danish Geodata Agency

The Danish Geodata Agency in its role as a hydrographic office has responsibility for hydrographic surveys and charting in Denmark. It is responsible for the production of nautical charts of the waters surrounding Denmark, the Faroe Islands and Greenland, just as the Danish Geodata Agency is responsible for the implementation of the Danish MSDI and also represents Denmark internationally within the marine geodata field (MSDI). The Danish Geodata Agency is responsible for charting, and issuing Chart Corrections and related nautical publications such as INT 1 and pilots (sailing directions) and for technical support to delimitation of the Danish maritime boundaries.

The practical work of hydrographic surveys is still done with personnel and ships from the Royal Danish Navy. Survey personnel from the Navy are part of the organization of the Danish Geodata Agency.

The Danish Geodata Agency works closely together with the Danish Maritime Authority, which is responsible for issuing of Notices to Mariners and List of Lights. Tide tables and operational tide gauges are the responsibility of Danish Meteorological Institute.

2. Surveys

Coverage of new surveys

The Danish hydrographic survey operations have been carried out in the following areas in 2017:

1. Danish waters inside the Skaw according to the HELCOM RE-SURVEY plan of the Baltic routes and areas.
2. The west coast of Greenland.

Danish waters:

The hydrographic surveys inside the Skaw are carried out in accordance with the HELCOM Copenhagen Declaration, adopted on 10 September 2001 by the HELCOM Ministerial Meeting. In addition, survey of areas with intense traffic in the North Sea has been initiated.

Figure 2. 2017 survey areas in Denmark.

In accordance with the Declaration a coordinated survey plan has been made for re surveying the Baltic Sea area. Therefore, the main survey effort has been placed on the primary shipping routes through the Danish waters and other areas of interest for navigation. The routes and areas will be re-surveyed to meet the standards of “Special Order” or “Order 1” as set in the International Hydrographic Organisation “Special Publication No 44”.

The Surveys in 2018 will be a continuation of the revised coordinated re-survey plan for the Baltic area. See the HELCOM web site for details:
https://helcomresurvey.sjofartsverket.se/helcomresurveysite .

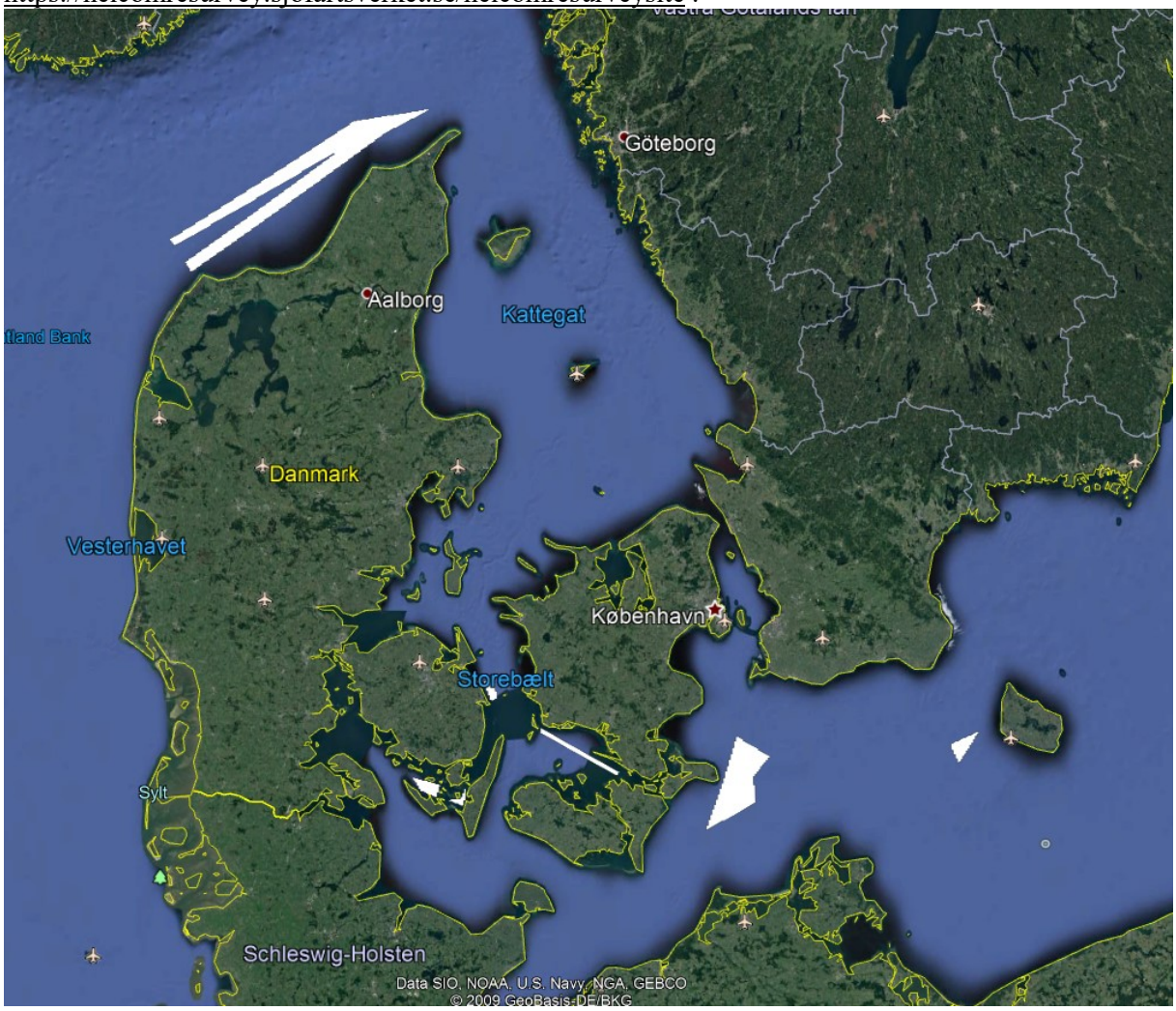

Figure 3. Planned surveys for 2018.

In addition to the original HELCOM resurvey plan, Denmark and Sweden is preparing a revision of the routes from Skagen through the Kattegat. Some of the proposed changes will be re-surveyed in 2018-2019.

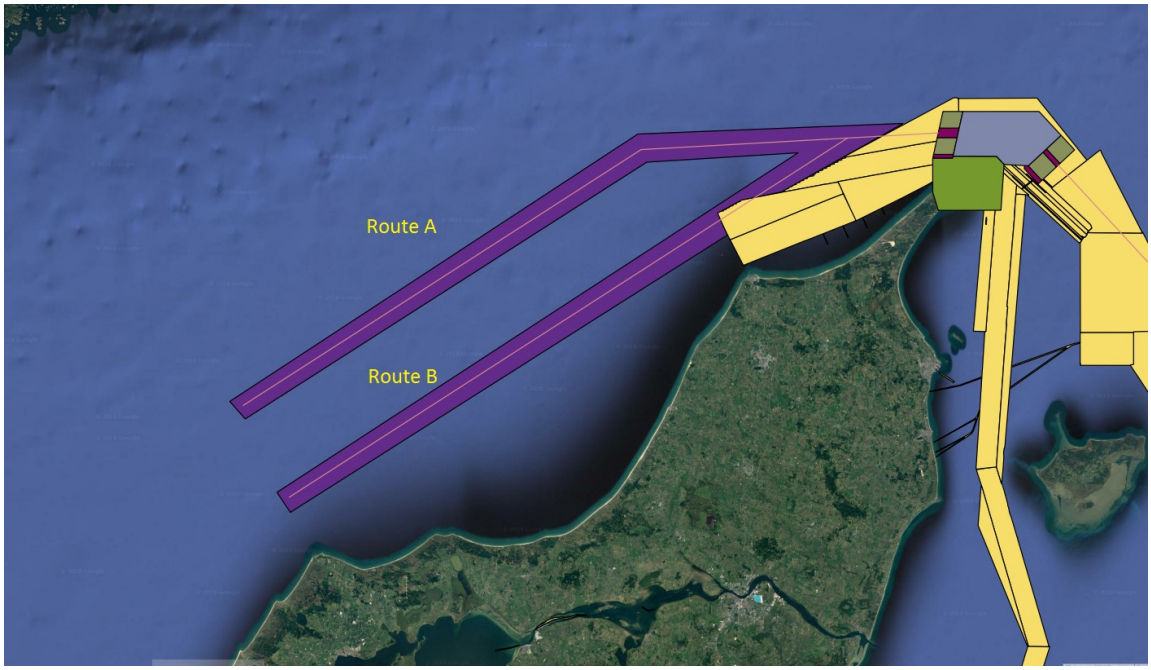

Figure 4. Surveys for 2018.

Greenland waters:
The surveys on the west coast of Greenland were carried out in the archipelago and near coastal zone, in order to allow safe access to major ports and to locate sheltered coastal fairways. A prioritized program for the resurvey of Greenland waters is in force. The main emphasis is placed on the most populated areas on the west coast.
All surveys were carried out with multibeam echo sounder systems.

The surveys in the Greenland waters in 2018 will be a continuation of the re-surveying program of the inshore routes between ports in Greenland. Some near shore areas and fjords are being surveyed for the safety of cruise ships operating on the west coast.

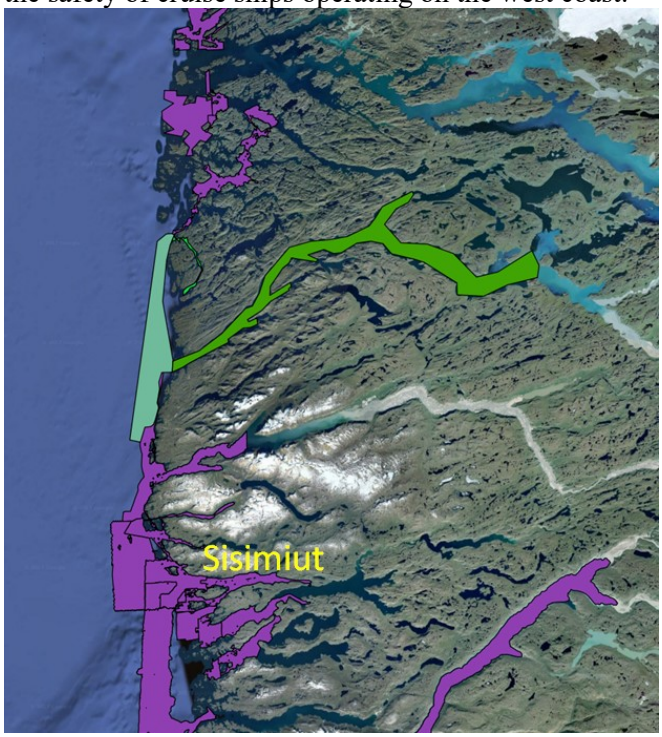

Figure 5. Survey areas in Greenland 2018

New ships
Denmark has commissioned two new survey platforms in 2018.

Name:	LAUGE KOCH
Displacement:	1720 ts.
Year of Commission:	2018
Number of crew:	22

The new coastal patrol vessel for Greenland is fitted with multibeam.

Name:	SAR 3
Displacement:	12 ts.
Year of Commission:	2018
Number of crew	3

3. New charts & updates
Charts (paper as well as electronic navigational charts (ENC)) covering the Danish, Faroese and Greenlandic waters are produced and updated by the Danish Geodata Agency.

ENC distribution method
All the Danish-produced ENCs and updates (ERs) are distributed through a network of IC-ENC authorized distributors.

ENC – Danish waters
The Danish waters have been covered by ENCs in various navigational bands since June 2000.
All the agency's ENCs are updated on a weekly basis.

Charts – Danish waters
10 new Danish editions were published in 2017

National paper charts
The chart portfolio of the Danish waters comprises 63 charts, all produced according to international standards.

The chart index showing the Danish waters is available at:
http://www.danskehavnelods.dk/indexkort/danskesoekort.html

The chart portfolio of the Greenlandic waters comprises of 80 charts and several charts with harbour plans all in varying quality. All new charts are produced according to international standards.

The chart index showing the Greenlandic waters is available at:
http://www.danskehavnelods.dk/indexkort_gronland/gronlandskesoekort.html

The chart portfolio of the Faeroe waters comprises of 8 charts including charts with harbour plans all in varying quality. All new charts are produced according to international standards.

The chart index showing the Faeroe waters is available at:
http://www.danskehavnelods.dk/indexkort_faeroerne/faeroskesoekort.html

Geometric rectification of the Greenlandic charts
The geometric rectification of the Greenlandic charts has reached 32 charts. The line of production is now based on the principle "data and ENC first" which means that data are being enriched to ENC standard before paper chart are being produced. As per the first quarter of 2017 30 charts were distributed as ENCs.

Faroese waters
All the Faroese paper charts were converted to ENCs and released in 2012.
1 new Faroese edition was published in 2017.

Challenges
2016 and 2017 has been a transition period for the Danish Hydrographic Office. A lot of our experienced employees have left the office for other jobs and we have now established a new organisation with less experience and new employees. As a result of this, the number of new editions of paper charts in Denmark has been less in 2017 and the production unit for Greenlandic charts has not finalize and distribute new products over Greenlandic waters in 2016 and 2017. The Greenlandic chart production team will continue to re-establish the needed knowledge base for chart production and will focus on selected data processes and the capability to produce ENC and paper charts and updates to ENC and paper charts in 2018.

4. New publications & updates

New publications
- No new publications

Updated publications
The Danish Maritime Authority updates the following publication and reports online:
- Navigation through Danish Waters

The Danish Meteorological Institute updates the following publication and reports online:
- Tide tables for Danish, Faroese and Greenland waters

The Danish Geodata Agency's online publications:
- Charts and publications catalogue (in Danish)
- Kort 1/INT 1 (bilingual)
- Søkortrettelser/Chart Corrections (bilingual)
- Bag om søkortet/Behind the Nautical Chart (in Danish/in English)
- The Mariner´s Handbook – Danish Waters (in Danish)
- The Danish Harbour Pilot (in Danish)
- The Greenlandic Pilot - East Greenlandic Waters (in Danish/in English)
- The Greenlandic Harbour Pilot (in Danish)
- The Mariner´s Handbook – East Greenlandic Waters (in Danish/in English)

The Danish Geodata Agency's printed publications:
- Charts and publications catalogue (in Danish)
- Kort 1/INT 1 (bilingual)
- The Danish Harbour Pilot – Commercial Ports (in Danish)
- The Greenlandic Pilot - West Greenlandic Waters (in Danish)
- The Faroese Pilot (in Danish)
- The Faroese Harbour Pilot (in Danish)
- Mariners' Routeing Guide Baltic Sea:

The Danish Geodata Agency has in 2017 launched a new web version of the Mariners' Routeing Guide Baltic Sea. *http://balticsearouteing.dk/plan/*

The web version of the Mariners' Routeing Guide Baltic Sea is maintained by the Danish Hydrographic Office. The content of the web version is identical to the printed edition of chart 2911 (INT 1200)

Mariners' Routeing Guide Baltic Sea, which is published by Bundesamt für Seeschifffahrt und Hydrographie (BSH).

The web version is routinely updated with corrections published by BSH in Nachrichten für Seefahrer (NfS). ”Versions and Updates” provides an overview of the corrections that have been added to the web version since the release of the latest printed version of the guide.

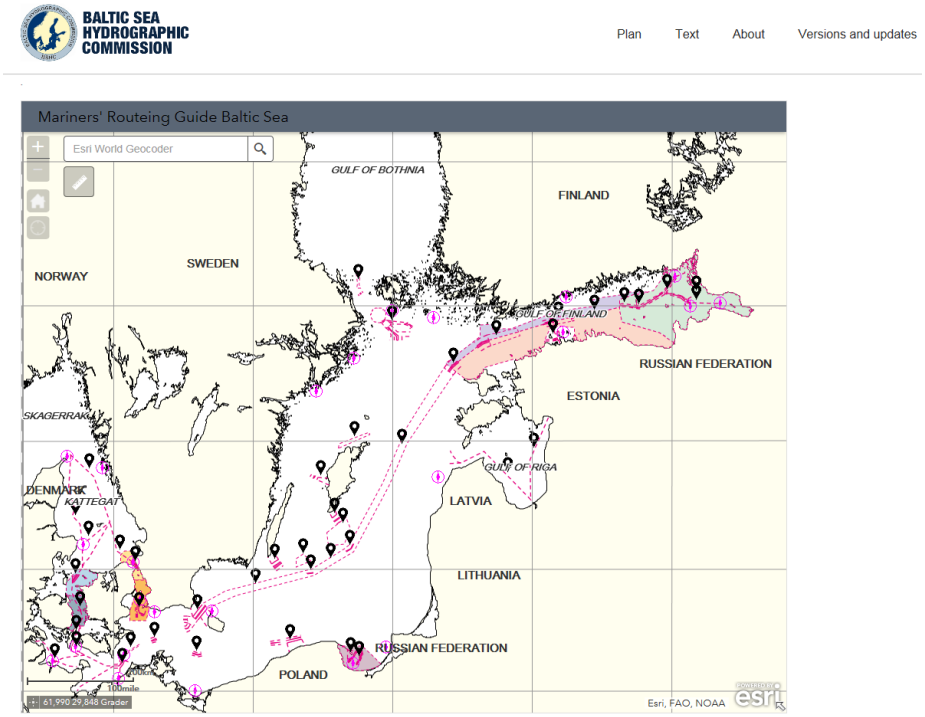

Figure 6. Mariners' Routeing Guide Baltic Sea

5. MSI

NAV Warnings, Information to mariners and oceanographic forecasts are available in English on the following web pages:

Navigational warnings Denmark:
http://www.dma.dk/SikkerhedTilSoes/Sejladsinformation/nautisk_information/Sider/nautisk_information.aspx

Meteorological warnings and forecasts Denmark:
http://www.dmi.dk/en/vejr/
http://ocean.dmi.dk/anim/index.uk.php
http://ifm.fcoo.dk

Meteorological warnings and forecasts Faroe Islands:
http://www.dmi.dk/en/faeroeerne/
http://ocean.dmi.dk/anim/index.uk.php
http://ifm.fcoo.dk

Meteorological warnings and forecasts Greenland:
http://www.dmi.dk/en/groenland/
http://ocean.dmi.dk/anim/index.uk.php
http://ifm.fcoo.dk

6. C-55

State of surveys updated February 2018 (See IHO web page for details.)

7. Capacity Building

New production system
Today due to historical reasons The Danish Hydrographic Office is divided in two separate parts, one department covering Danish and Faroese waters and the one department covering the Greenlandic water. The two departments are using 2 different systems for producing ENCs and Papercharts.

One of the strategic projects for DGA in 2018 and 2019 will be the implementation of a new production system for production of ENC and paper charts. A new production system will be a part of the Agency's aim to align its two maritime production flows and secure the needed focus on a smaller and more focused agency where it is important to concentrate resources and knowledge on fewer systems and become more flexible across the two departments.

One of the production systems in use today is an older file based system where the production processes are insufficient because of redundancy and many unnecessary manual steps. DGA see high potentials for improving efficiency by implementing a production system which is data driven, meaning a system with well-defined interfaces between the different parts of the production chain from data management to maritime production and final distribution.

Long term DGAs vision for the new production system is higher automatization of traditional chart production, but also the ability to produce other new chart products and data-sets easier and faster than today
The plan for DGA is to start producing in the new data driven system by the end of 2019

FAMOS
DGA participated in the EU-project FAMOS together with most of Hydrographic Offices in the Baltic Sea countries. The purpose of the project was to increase both the survey capacity for the national waters and the capacity for the following data processing. The FAMOS project was for DGA a possibility to increase the data processing capacity through slightly increased number of staff and developing new and more efficient data processes for production of ENC and chart.
FAMOS has resulted in a new conceptual design of the IT-infrastructure for the bathymetric databases, improvements of selected processes of the dataflow for "ping to DB" and implementation of a new tool for generating depth contours and selecting soundings. Currently DGA has a tendering process for both a new bathymetric database and a new production system for paperchart and ENC production.

EfficienSea 2
DGA participate in the European Project Efficient, Safe and Sustainable Traffic at Sea - EfficienSea 2.0. The aim of EfficienSea 2 project is to improve navigational safety and efficiency as well as emergency response, to decrease administrative burdens and improve environmental monitoring and enforcement. The development of a Maritime Cloud – a communication framework for both e-Navigation and e-maritime – is central, as is the maturing of emerging communication technologies improving ships connectivity. The project will showcase e-navigation services in the Baltic and in the Arctic while contributing to upgrade of international maritime safety regimes. The project has 32 partners from twelve countries including eight Baltic Sea region countries.

The focus is to co-create and deploy innovative solutions for safer and more efficient waterborne operations encompassing excellent technical and human factor competences, equipment, system- and service providers as well as authorities, with expert domain and regulatory knowledge and influence.

New technologies and/or equipment
All ships in the Danish survey fleet are equipped with Reson 7125 200/400 KHz SW2 multibeam systems. Test trials have been conducted in 2015 with the aim to survey directly on a LAT-model of the waters around Greenland. This method will, with time, make tide gauges redundant for surveys in the south of Greenland.

8. Oceanographic activities

Tide gauge network
The Danish Meteorological Institute and other governmental bodies, maintain a network of water level stations spread across Denmark. The data are used in several ways, primarily for safety of navigation, but are also an integral part of the national storm surge monitoring and prediction system. Data updated are transferred from each station to the oceanographic database every ten minutes.

Online observations and forecasts are available in Danish and English on several web sites such as: http://fcoo.dk/

Tidal prediction
Tides are predicted and presented for a range of Greenland cities.
Tidal predictions are available on line at the Danish Meteorological office as tables www.dmi.dk and as a graphic interface at http://fcoo.dk/ The tidal pages from FCOO are available in English.

UNCLOS
The Danish Geodata Agency is actively involved in the work of The United Nations Convention on the Law of the Sea (UNCLOS) in the waters around Greenland and the Faroe Islands.

The Danish Geodata Agency is responsible for the data quality assessment on existing bathymetric data and planning and technical specifications for new surveys. There have been no new UNCLOS surveys in 2017 in the Danish area of interest.

9. Other activities

Participation in IHO Working Groups
The Danish Geodata Agency has the chairmanship for the IHO MSDI Working Group and the Baltic Sea and North Sea MSDI Working Group (BS-NSMSDIWG).

The Danish Geodata Agency has been involved in the work done by IRCC, HSSC, S100-WG, ENCWG, NCWG, NIPWG, IENWG, CSBWG and DQWG, OGCMDWG and UNGGIM MWG.

National
A MSDI-forum for collaboration has been established between 11 public authorities to ensure an efficient and coordinated development and use of maritime data. MSDI-forum membership is based on those authorities that are a part of the collaboration for a Danish MSDI. The MSDI-forum is administrated by a secretariat, established in the Danish Geodata Agency. Other institutions, e.g. within research, can, based on permission from the MSDI-forum, utilise the MSDI to exhibit relevant MSDI data, but are not a part of the MSDI collaboration, and therefore not represented in the MSDI-forum. However, they will have an affiliation via a relevant authority in the MSDI collaboration.

Authorities that want services within the MSDI, pay an annual fee in accordance to a financial model. This applies regardless if a participant provides data or not. Other institutions, such as universities, which, based on agreement with the MSDI-forum, contributes with relevant data to the MSDI, but do not use services from the MSDI, can do this outside of the financial agreement.

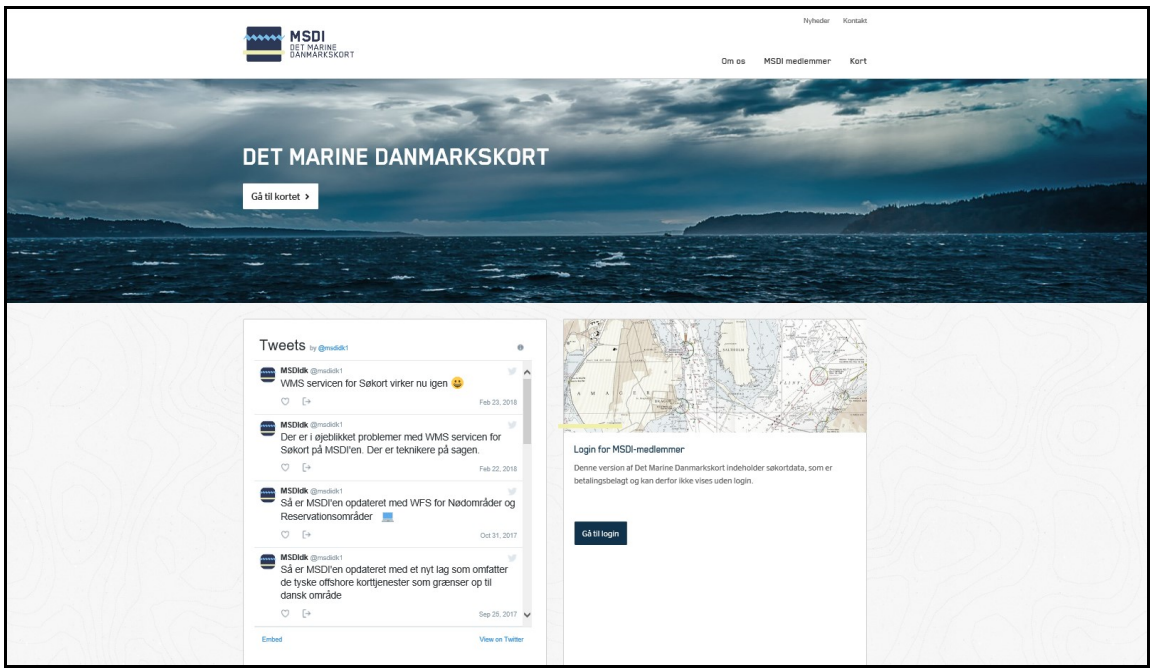

Figure 7. The Danish MSDI.

For a portion of the data that is a part of the MSDI, it is applicable that they are subject to the INSPIRE Directive. For INSPIRE data, it is amongst the requirements to establish metadata, data will be available in standardised form and there will be established services, so data can be shown and downloaded.
For some dataset, which will be included in the MSDI, applies that they are priced, such as nautical chart data. It is the individual data owners that set the guidelines for use of their data including access criteria, payment models and international exchange.

MSP legislation
Denmark does not yet have a comprehensive spatial plan for its sea areas. However, a range of sectoral plans exist (e.g. energy infrastructure, fisheries, nature protection, etc), and these will comprise key input to the coming maritime spatial plan. The coming spatial plan will apply to the marine internal waters, territorial sea and the EEZ. The Danish MSDI will ensure that the data needed will be available through the MSDI.

The Danish Parliament has adopted an Act on Maritime Spatial Planning that establishes a framework for MSP in the Danish marine waters. The purpose of the Act is to promote economic growth, the development of marine areas, and the use of marine resources on a sustainable basis. The Act aims to contribute to achieving the goals of maritime spatial planning while taking account land-sea interaction and strengthening cross-border cooperation.

Sectors to be included in the future maritime spatial plan include: the energy sector, maritime transport, fishing and aquaculture, the extraction of raw materials and the preservation, protection and improvement of the environment, including resilience to the consequences of climate change. Military activities, cultural heritage, municipal plans for use of coastal waters, and others will not be regulated by the plan but it will take these into account. Economic growth is a strong focus for the maritime spatial planning of the Danish marine waters.

The ‘’Act on Maritime Spatial Planning’’ is available in an English translation here:
http://www.dma.dk/SiteCollectionDocuments/Legislation/Acts/2016/L-615-08062016-marine%20planning%20act.pdf

International
The Danish Geodata Agency is also active in the HELCOM Monitoring Working Group and participates in the newly established OGC Domain WG and the Arctic MSDIWG.

Websites
The Danish Geodata Agency:
http://www.gst.dk/English/
http://www. eng.navigation.gl/

The Danish Maritime Authority:
http://www.dma.dk/

Danish Meteorological Institute:
http://www.dmi.dk