



**Release
of publicly
funded data
in the nautical chart area**

The socioeconomic potential
(Pixi version)

June 2019

About the analysis

An analysis conducted by Deloitte for the Danish Geodata Agency has mapped the socioeconomic potential of the release of publicly funded data in the nautical chart area

Background

In line with the ever-increasing digitalisation of our society, a global movement has been advocating publicly available data. Publicly available data is expected to create value for the users of the data, in that data forms part of and improves existing processes, products or services, or makes it possible to develop new ones, and as such constitutes a significant driver for innovation in both the private and the public sector.

With the establishment of the Basic Data Programme in 2013, Denmark was one of the first countries in the world to release public data, and the release of more public data has subsequently been discussed, including data in the nautical chart area. Most recently, in 2018, the Danish Government decided that meteorological data should be made available to the public free of charge, and in the Blue Denmark growth plan, the Government is contemplating that the release of publicly funded data should also be possible in the maritime area in order to make it easier for firms and entrepreneurs to identify market potential and create new business models.

In this context, Deloitte, in collaboration with the Danish Geodata Agency (*Geodatastyrelsen*), has conducted a socioeconomic business case analysis of various scenarios for a potential release of publicly funded data and data products in the nautical chart area. **The analysis identifies the potential in terms of increased safety at sea and other benefits from a welfare economic perspective. With a release of publicly funded bathymetric data and simultaneous investment in bathymetric data, a number of efficiency and market effects are also expected to materialise.**

The potential of releasing data in the nautical chart area is elaborated on in the following.

Data and methodology

The analysis takes its starting point in the governmental business case model. Input for the model in the form of the consequences of a release of data in the nautical chart area is estimated based on empirical figures from firms and industry associations, previous analyses regarding the release of publicly funded public data or in cooperation with relevant experts, including:

- Interviews with employees at the Danish Geodata Agency with special knowledge of data in the nautical chart area and the IT-related support for the production and communication thereof.
- Interviews with representatives from a number of selected industries, including industries which already today use data in the nautical chart area as a central part of their work, as well as industries which are deemed to be able to benefit from this in the future.

The Danish Geodata Agency has five main classes of customers for the agency's data and data products:

1. Players within commercial maritime traffic
2. The energy sector
3. Data firms and business partners
4. Public authorities and research
5. Leisure craft boaters and tourists.

The informants for the interviews have been recruited from these classes, and the analysis focuses primarily on the consequences for these classes of customers in the event of a potential release of publicly funded data.

Data in the nautical chart area

Data in the nautical chart area is used, among other things, for navigation products, but also has a wide range of other applications

The Danish Geodata Agency compiles and processes a range of data and information relating to Danish waters and, on this basis, produces electronic charts, analogue charts, datasets and services etc., collectively called the Danish Geodata Agency's product portfolio (or just products).

The Danish Geodata Agency receives hydrographic survey data from the Armed Forces, private players and external suppliers. The hydrographic survey data received is subsequently processed by the Danish Geodata Agency. The processed data is then included in the Danish Geodata Agency's production of nautical charts in two categories:

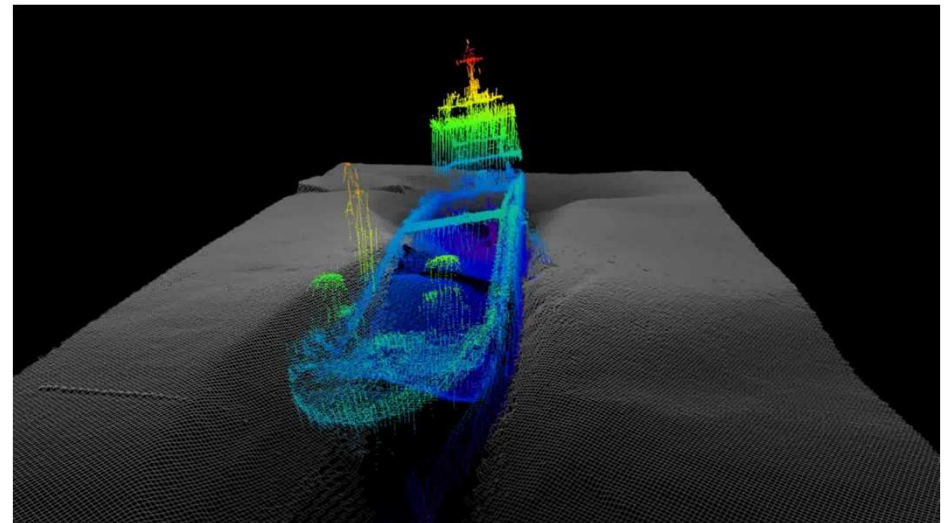
1. Analogue nautical charts and S-57.
2. Datasets (point cloud data, backscatter data and sound velocity data).

The datasets are available to firms and private players to a very limited extent only. The products are distributed primarily through business partners which further process and/or further develop the products and sell them to end-users. These concern printed paper charts, which are sold and distributed by Rosendahls, as well as non-official navigation products developed and sold by a number of different business partners. The products (raster data of the analogue charts and S-57 data) are also distributed to a limited extent directly from the Danish Geodata Agency to a number of customers which use the products for purposes other than navigation and route planning. Data is for example used by the energy sector in the screening, planning and establishment phases of offshore construction projects, e.g. an offshore wind farm, and nautical charts and chart data also form a key part of the work carried out by a wide range of public authorities which in one way or another regulate the use of Danish waters.

The end-users buying directly from the Danish Geodata Agency are mainly the Armed Forces, the pilot service, public authorities, research institutions, energy companies and data firms. The latter includes, among other things, manufacturers of navigation products and firms offering products and analyses based on publicly available data. The firms pool data in new ways and build models which illustrate, for example, the risk of flooding for a given geographic location.

The potential of releasing publicly funded data in the nautical chart area assumes that both the products (analogue charts and S-57) and the datasets (point cloud data, backscatter data and sound velocity data) are released. The latter assumes that the Danish Geodata Agency develops and maintains a bathymetric model.

Figure 1: 3D image of FAROS from Tannis bay based on point cloud data



Source: The Danish Geodata Agency

The socioeconomic potential of releasing publicly funded data

The overall potential of releasing publicly funded data in the nautical chart area is composed of three types of benefits

Market effects

Arise when public authorities and private firms, which have not previously realised the full potential of nautical chart data, either because the data is too expensive or not available at all, optimise the use of this data. For example by the players integrating the nautical chart data in existing or completely new services and products, thereby increasing their quality and value for the customers. The market effects are estimated as growth in revenue in the industries concerned which can be attributed solely to the release of publicly funded data.

Efficiency effects

Occur when public authorities and private firms start to integrate the released data in a new or improved manner in internal workflows, so that the work can be performed faster, cheaper or better than before. The efficiency effects are estimated as cost savings in the industries concerned which can be attributed solely to the release of publicly funded data.

Welfare effects

Are effects which are not necessarily realised or priced in a market, but which entail useful value for the individual or for society at large. An example of a welfare effect is improved maritime safety, which must be seen in relation to both the risk of loss of lives, financial losses and environmental impact, for example in connection with running aground or collision.

The welfare economic potential of releasing publicly funded data

A release of publicly funded data is associated with welfare effects which do not have a direct economic impact but which, on the other hand, have a significant useful value for society

The welfare effects are mainly seen in relation to leisure craft sailing and tourism as well as in connection with the authorities managing their responsibilities and research.

Leisure craft boaters and tourism

A release of publicly funded data is expected to result in a price fall and/or increased quality of the navigation products (e.g. mobile apps) from private third parties, which leisure craft boaters primarily use for navigation.

The price fall is expected to increase the use of the navigation products, resulting in increased sailing quality, **increased maritime safety** and fewer vessels running aground. At the same time, the risk of leisure craft boaters causing problems for commercial maritime traffic or damaging seabed installations (e.g. power cables) is reduced. Moreover, the increased sailing safety may have a number of derivative effects in the form of **lower insurance costs and lower costs for sea rescues**. Finally, it is estimated that the release of publicly funded data may have a positive effect on maritime based tourism through free access to high-quality data on Danish waters.

The public sector and research

A release of publicly funded data is expected to increase the use of nautical charts and chart data by public authorities and research institutions, resulting in better regulation and research into the use of the sea. This may, for example, mean that the Danish Geodata Agency's **nautical charts and chart data can be integrated into other authorities' solutions, services and apps** for citizens and businesses. This could, for example, be in the Danish Maritime Authority's free online version of Notices to Mariners and in the safe sailing app *SejlSikkert* of the leisure craft safety board *Søsportens Sikkerhedsråd*, which helps private leisure craft boaters stay safe at sea.

A release of publicly funded detailed bathymetric data is expected, among other things, to provide the Danish meteorological institute *DMI* with data input for a variety of weather models, including **storm surge forecasting models**. Detailed bathymetric data will also increase the quality of the research within, for example, the **fishing industry** and marine spatial planning, which are directly involved in both national and international policy-making processes and play a role in determining how various marine areas are regulated. Finally, detailed bathymetric data can give **authorities which are responsible for seabed installations** (e.g. the Danish Energy Agency) a better starting point for finding suitable areas for the installations and for identifying risks.

The welfare effects described are not quantified and are thus not included in the potential calculations, which therefore represent a conservative estimate.

The socioeconomic benefits from releasing publicly funded data

A release of publicly funded data is linked to a quantifiable economic potential of DKK 145 million within three classes of customers in a three-year perspective

The release of the Danish Geodata Agency's data and products is associated with socioeconomic benefits in the amount of DKK 145 million in the first three years after the data has been released (DKK 48 million per year) within three classes of customers. Realising the full potential requires investment in the development and operation of bathymetric models as well as quality upgrading of bathymetric data in certain parts of the Danish waters.

Commercial maritime traffic

For players within commercial maritime traffic (e.g. shipping companies, pilot stations and ports), potential has particularly been identified within consultancy, where bathymetric data with a higher resolution than what can be found on an ordinary nautical chart can be integrated with, for example, released publicly funded weather data in **new state-of-the-art route planning models**. A player in the industry sees a significant market potential in using the bathymetric data when consulting shipping companies in the route planning phase. The player sees it as a business area with high growth potential and expects that the demand for this type of consultancy service will increase significantly in the future. This industry player estimates that the potential for the release of publicly funded bathymetric data constitutes 5-10 per cent of the firm's net revenue growth, corresponding to **DKK 19-38 million per year**.

The energy sector

For players in the energy sector (e.g. energy producers, contractors and consulting engineering companies), the potential will particularly be in the screening process for large offshore construction projects, where detailed bathymetric data will mean that it will be possible to identify the most suitable areas for the installations with greater certainty and that uninteresting areas can be eliminated early in the screening process. A player estimates that this may mean that the planning and screening process for offshore construction projects can be reduced by 1-3 months. One estimate from the industry shows that the total savings will be DKK 1-10 million per construction project. This can be converted into an **efficiency potential in the industry of DKK 2.5-25**

million per year.

Data firms

There are mainly two types of firms where data in the nautical chart area can make up the core of products and services: navigation companies and data wholesalers.

For the **navigation firms**, a release of existing publicly funded data products means that they will save the costs of purchasing the products that they are currently incurring. However, the majority of the navigation companies are foreign-owned, and these benefits will thus accrue to other countries and are therefore not included in the business case calculation. However, the players point out that a release of data may lead to the establishment of Danish navigation firms in the future.

The **data wholesalers** are primarily small consultancy companies with highly specialised employees who, for example, use publicly available data in data models. The data wholesalers will examine the possibilities within nautical chart data and bathymetric data if these are released. They primarily see potential in bathymetric data, which they expect can improve existing data products and prepare the ground for the development of new products, which will increase demand and revenue. A player in the data wholesale industry estimates that the released data could generate about DKK 1 million in increased revenue. Converted to industry level, this will result in a potential **revenue growth of DKK 3-5 million per year**.

DKK million	Year 1	Year 2	Year 3	Total
Effects within commercial maritime traffic	28.5	28.5	28.5	85.5
Effects within the energy sector	13.8	13.8	13.8	41.3
Effects in data firms	4.0	4.0	4.0	12.0
Costs saved for the purchase of products (Danish firms and consumers)	2.0	2.0	2.0	6.0
Total socioeconomic effects	48.3	48.3	48.3	144.8



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