

# PRIMAR S-100 development

## PRIMAR's Vision

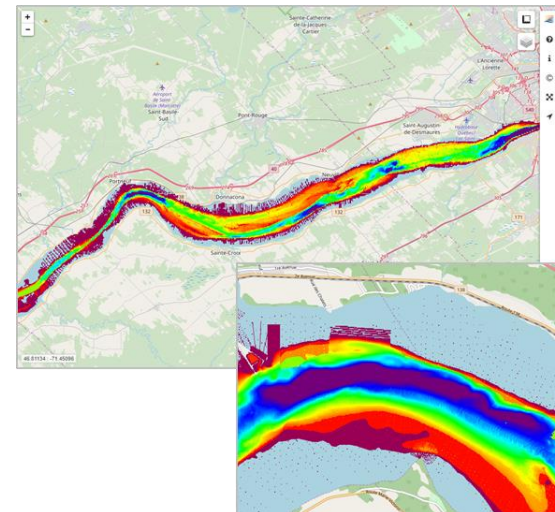
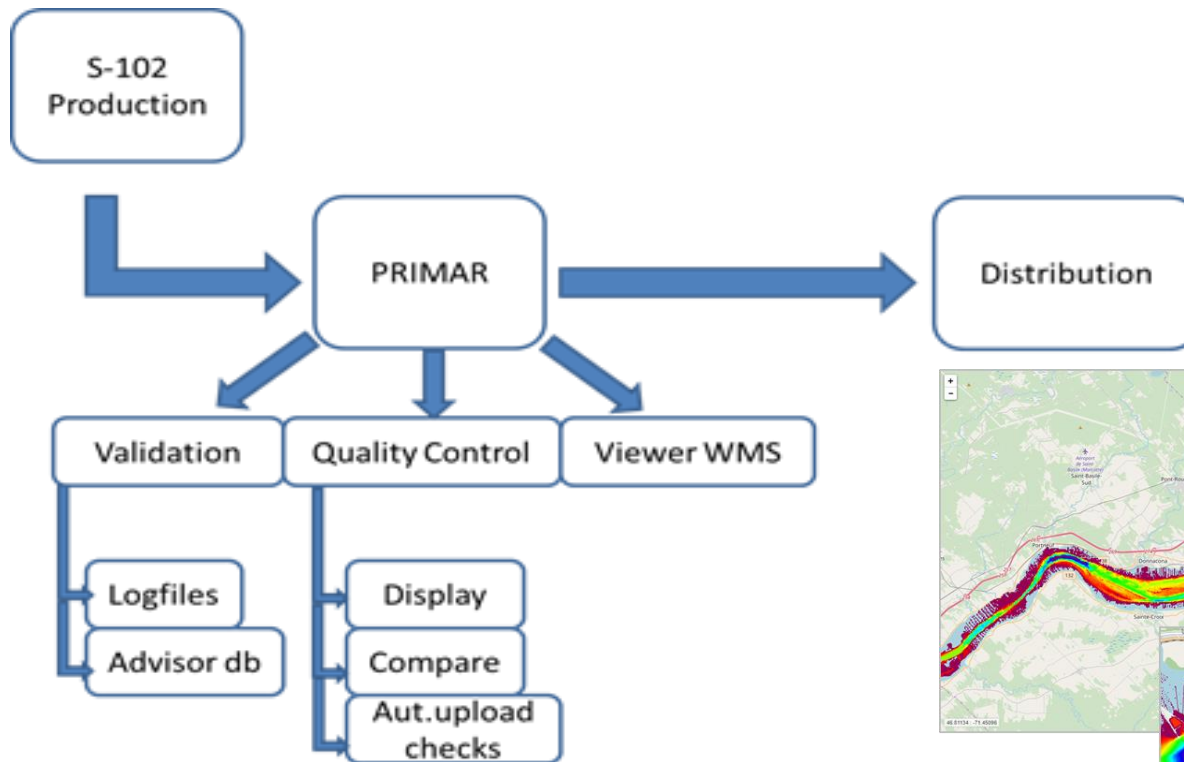
***IN ORDER TO ENHANCE SAFETY AT SEA AND PROTECT THE MARITIME ENVIRONMENT, PRIMAR'S VISION IS **TO BE THE MOST EFFICIENT MODEL FOR THE PROVISION OF ENC SERVICES AND MARITIME GEOSPATIAL DATA WORLDWIDE.*****

# PRIMAR S-100 Projects

- S-102 data upload, validation and distribution.
- S-102 in an operational environment.
  - Project supported by The Research Council of Norway
- S-100 Data as a Service.
  - Project in cooperation with CARIS and CHS
- S-101 data upload, validation and distribution.
- S-100 part 15 Data Protection (new S-63).
- Research project - IHO S-100 portfolio (S-101, S-102, S-104, S-111, S-129).
  - Project supported by The Research Council of Norway

# PRIMAR S-102 Project

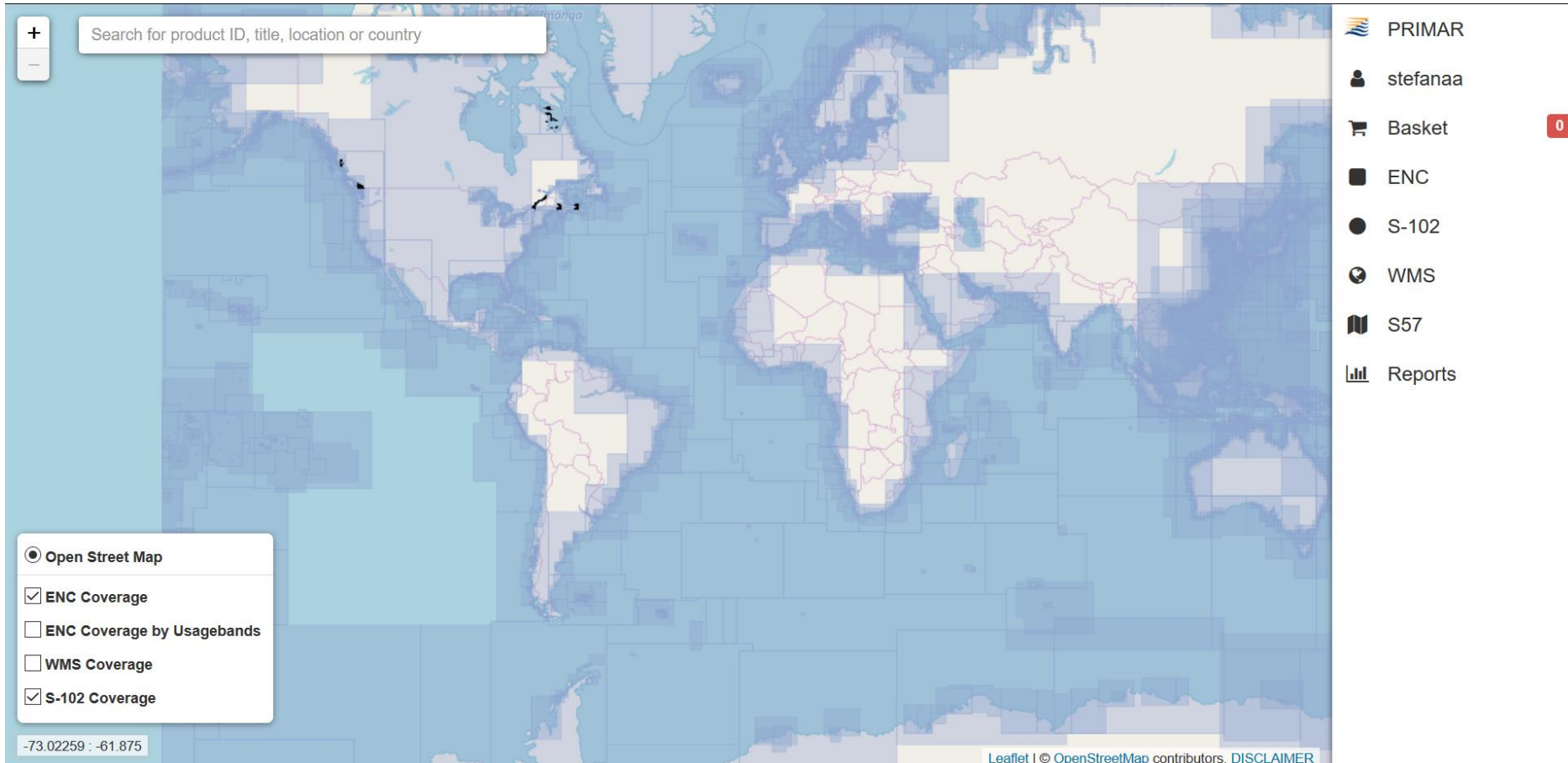
- Expand the PRIMAR service to encompass S-102 data.
- S-102 data upload, validation, viewer and distribution.



PRIMAR S-102 viewer

# PRIMAR S-102 Project

- S-102 data in the PRIMAR Chart Catalogue.

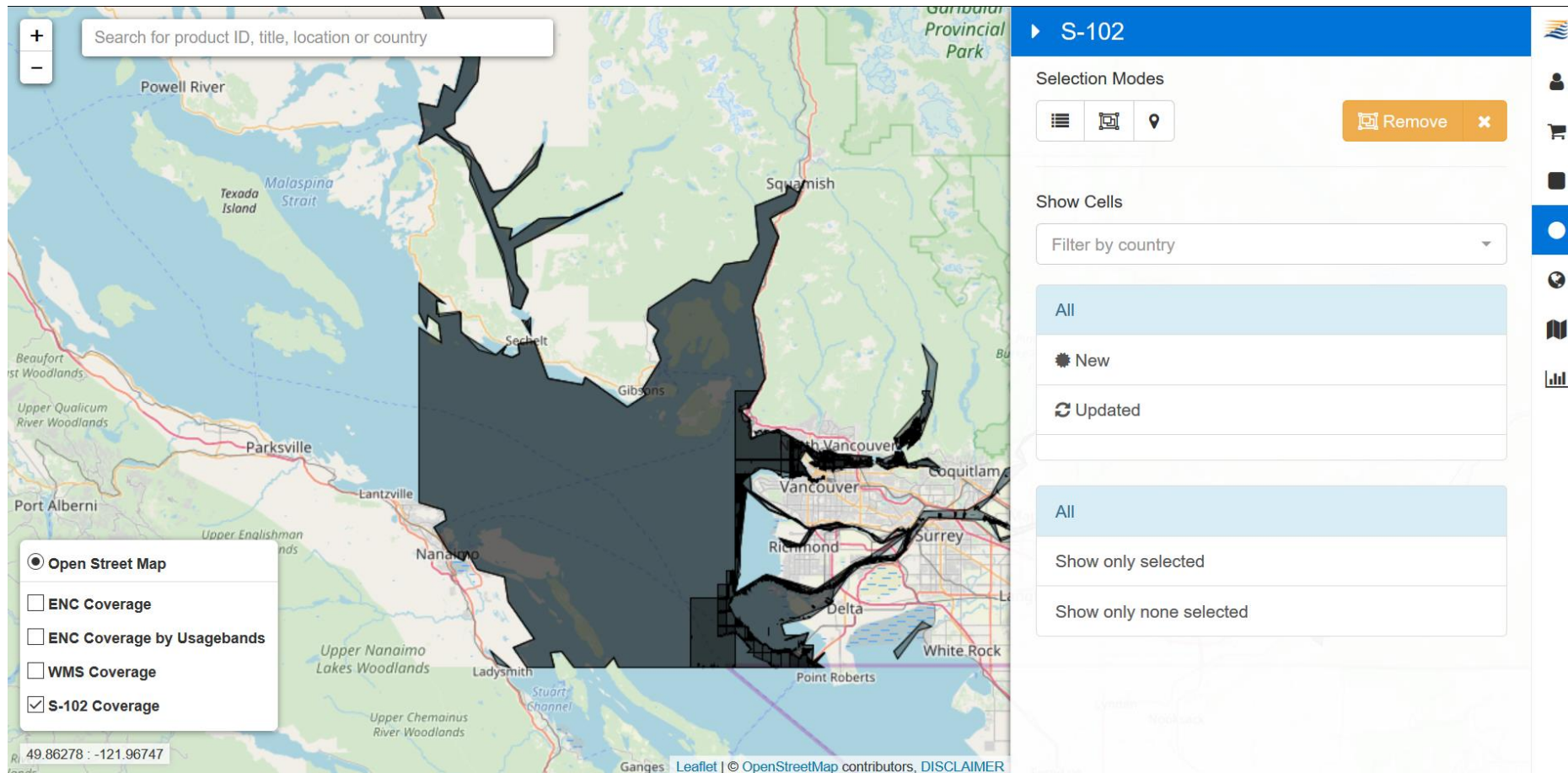


The screenshot displays the PRIMAR S-102 Project web application interface. The main area is a world map showing S-102 coverage in various shades of blue. A search bar at the top left contains the text "Search for product ID, title, location or country". A sidebar on the right lists navigation options: PRIMAR, stefanaa, Basket (with a red badge showing 0), ENC, S-102, WMS, S57, and Reports. A bottom-left panel shows map controls: "Open Street Map" is selected, and checkboxes for "ENC Coverage", "ENC Coverage by Usagebands", "WMS Coverage", and "S-102 Coverage" are visible, with "S-102 Coverage" being checked. The bottom status bar indicates coordinates "-73.02259 : -61.875" and includes the text "Leaflet | © OpenStreetMap contributors, DISCLAIMER".



# PRIMAR S-102 Project

- S-102 data selection in the PRIMAR Chart Catalogue.



The screenshot displays the PRIMAR S-102 Project interface. The main map area shows a coastal region with labels for Powell River, Malaspina Strait, Texada Island, Squamish, Sechart, Gibsons, Parksville, Port Alberni, Nanaimo, Ladysmith, Stuart Channel, Upper Nanaimo Lakes Woodlands, Upper Chemainus River Woodlands, Richmond, Delta, White Rock, Point Roberts, Surrey, Coquitlam, and Vancouver. A search bar at the top left contains the text "Search for product ID, title, location or country". Below the search bar, there are map controls including a zoom in (+) and zoom out (-) button, and a map type selector with options: Open Street Map (selected), ENC Coverage, ENC Coverage by Usagebands, WMS Coverage, and S-102 Coverage (checked). The bottom left corner shows coordinates: 49.86278, -121.96747. The bottom right corner has a disclaimer: "Ganges Leaflet | © OpenStreetMap contributors, DISCLAIMER".

The right sidebar is titled "S-102" and contains the following sections:

- Selection Modes:** Includes icons for list, map, and location, and a "Remove" button.
- Show Cells:** Includes a "Filter by country" dropdown menu.
- Filters:** Includes "All", "New", and "Updated" options.
- Display Options:** Includes "All", "Show only selected", and "Show only none selected" options.

# S-102 Demonstrator Project

Demonstrator for distribution and use of bathymetric data (S-102) in an operational environment. Project completed March 2019. Will lead into the S-100 portfolio project.

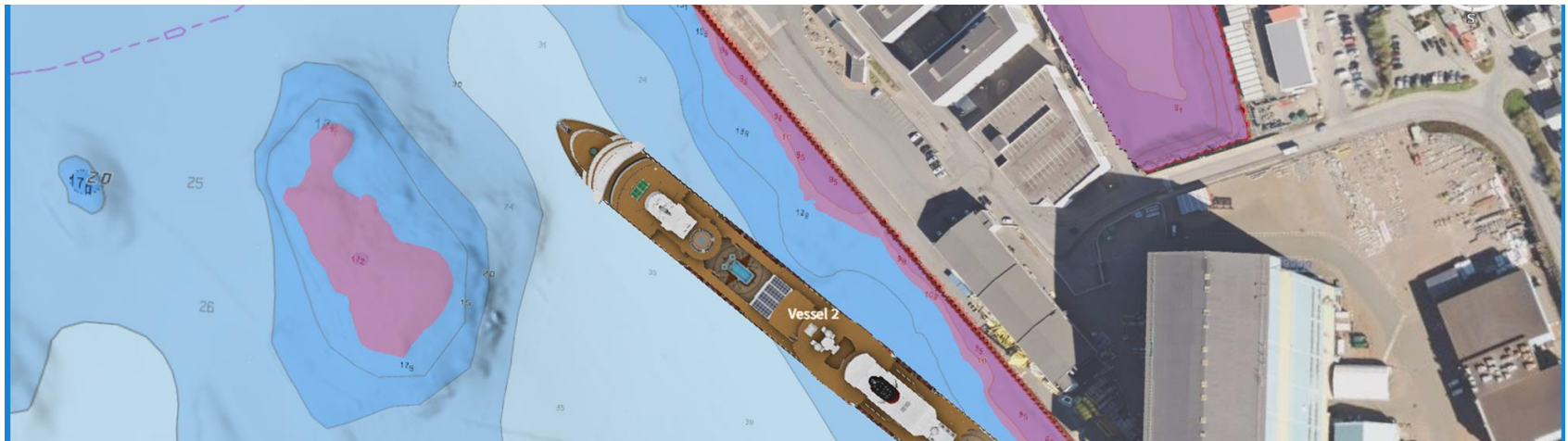
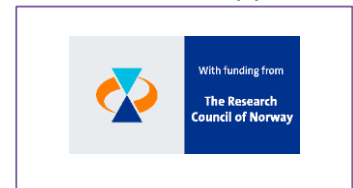
## The Project Team



## Partners & Operational Test Team



## Financial Support



# S-102 Demonstrator Project

Expected value from the project:

*To better understand how the S-102 data type can be utilized to provide a better basis for decision making regarding:*

- Resource planning
- Environmental impact
- Cost reductions
- Increased safety
- Accidents, Disasters and SAR operations
- Scientific purposes

[www.s-102.no](http://www.s-102.no)



Kvitsøy VTS watching MS Queen Victoria leaving harbor live video and via the S-102 Demonstrator



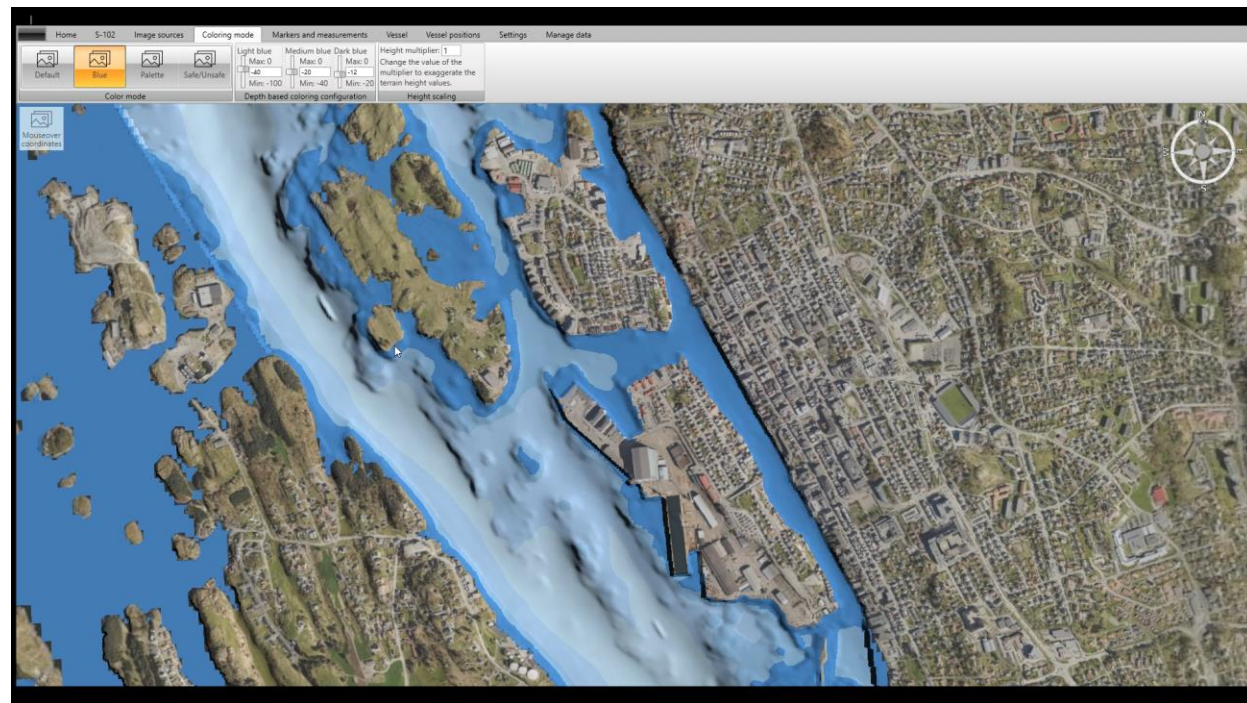
Comparing the S-102 data with ECDIS S-57 data onboard a patrol vessel from the Royal Norwegian Navy



# S-102 Demonstrator Project

Basic functionality in the Kongsberg S-102 Demonstrator:

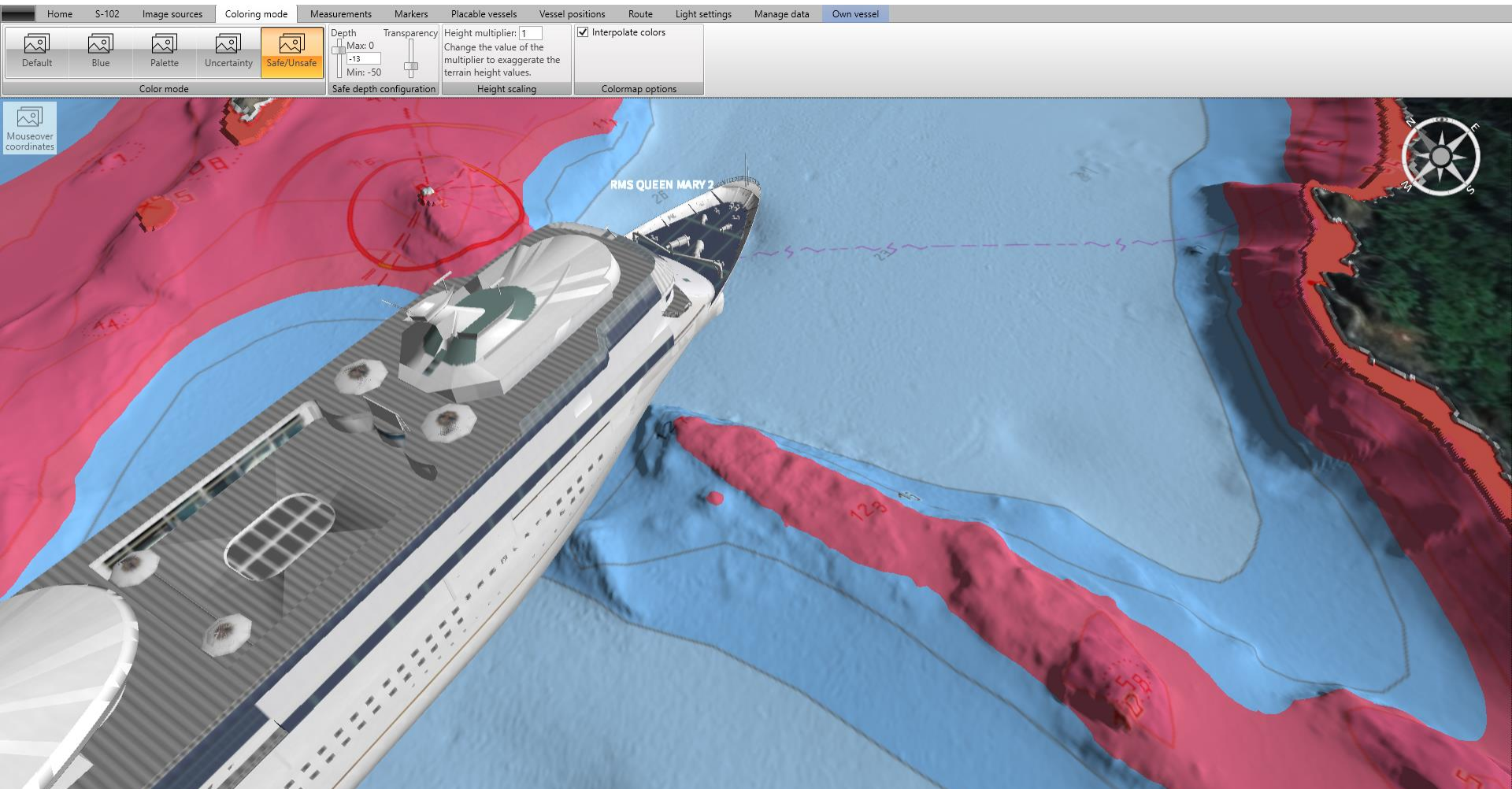
- Show various map layers in one view:
  - Bathymetry
  - Terrain
  - S-57 ENC
  - Orthophoto
- Switch between layers
- Navigation in chart
- Compass



# S-102 Demonstrator Project



- Queen Mary 2 voyage to the Port of Oslo







# S-100 Data as a Service

*A Dream Team:*

Proponent



Progressive  
Hydrographic  
Office

Technology  
Partner



Hydrographic  
Processing and  
Production  
Software

Technology  
Partner



ENC Distribution  
Software

Channel to  
Market



RENC

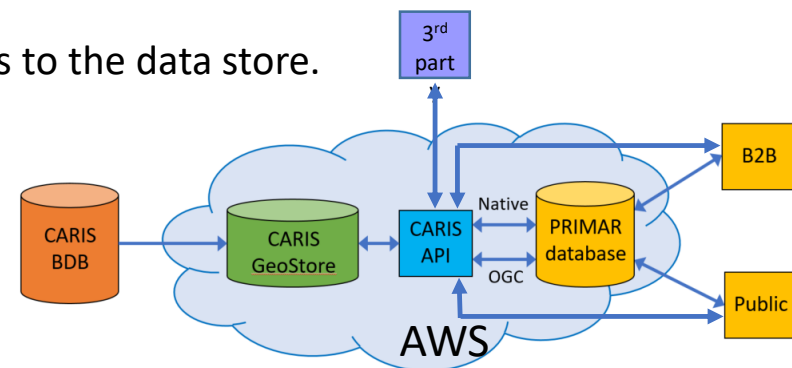
NHS

Investment Partners

# S-100 Data as a Service

## Pilot Project Overview:

- This pilot will allow CHS, Teledyne CARIS and PRIMAR to demonstrate its ability to provide a service that consumers of bathymetry data can subscribe to.
- Data will be available in pre-determined geographic areas of interest.
- By bathymetry data we mean coverages, vector features and S-102 products.
- CARIS will develop a cloud hosted datastore located outside of the CHS infrastructure.
- CARIS will develop a rich API providing 3<sup>rd</sup> party access to the data store.
- PRIMAR will expand its existing database and web applications to provide a store front to subscribe to the latest available S-102 bathymetry data and access OGC services.





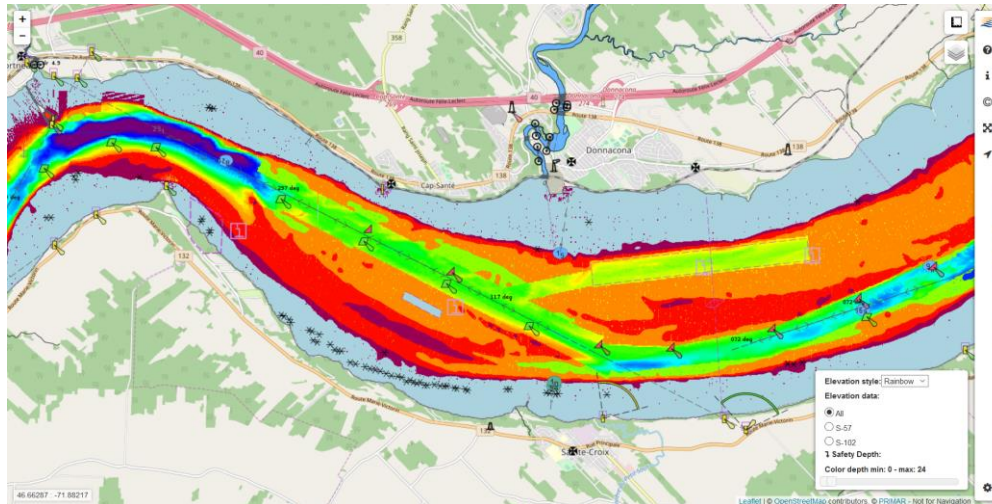
# S-100 Data as a Service

## Pilot Project Objectives:

- Garner support from potential stakeholder groups e.g. hydrographic offices, ports, pilots, other government agencies, global mapping initiatives (Seabed 2030).
- Expose the hydrographic community to these capabilities to foster support for the potential benefits of S-102 and bathymetry as a service.
- Explore potential for use of S-104 and S-111 standard for supplementary services.
- Refine the cloud and service technology to work towards a robust and commercially viable service.
- Determine the costs involved in offering cloud based storage and services.
- Develop innovative business models to ensure customer adoption by providing value added benefits for stakeholders.

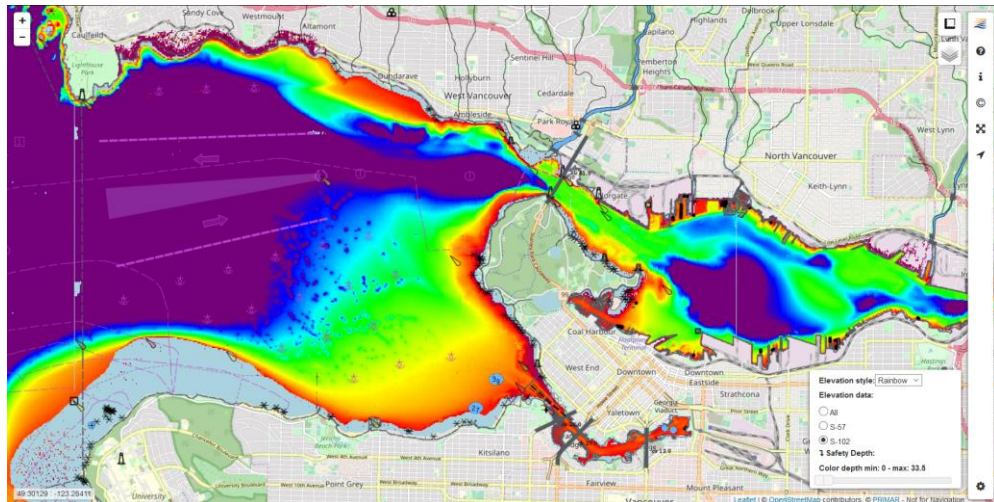
# S-100 Data as a Service

CHS S-102 data in PRIMAR Viewer:



St. Lawrence River

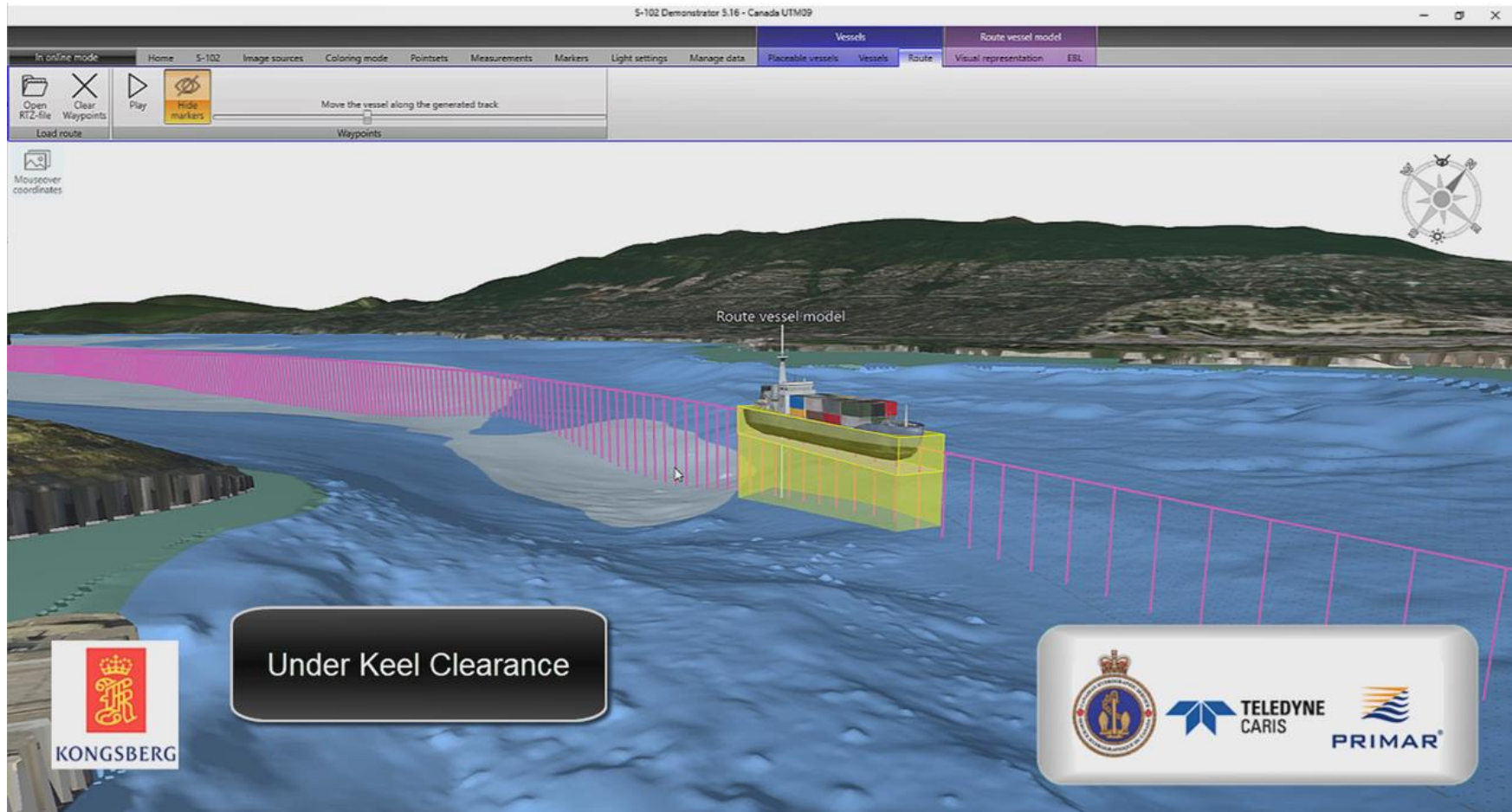
Vancouver



# S-100 Data as a Service

Vancouver

CHS S-102 data in Kongsberg S-102 demo:



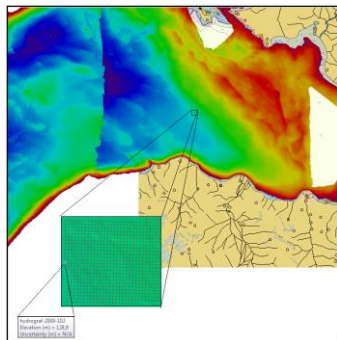
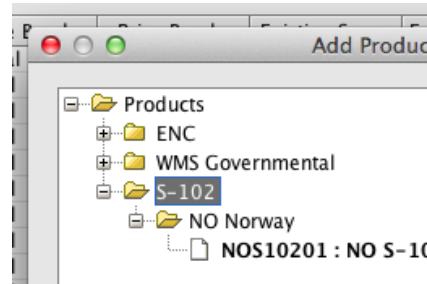


# S-100 Data as a Service – Value Chain

Data collection by HO or Contractor



PRIMAR provide channel to market



Data processing &  
S-102 production in  
CARIS software

Commercial  
and National  
Distributors

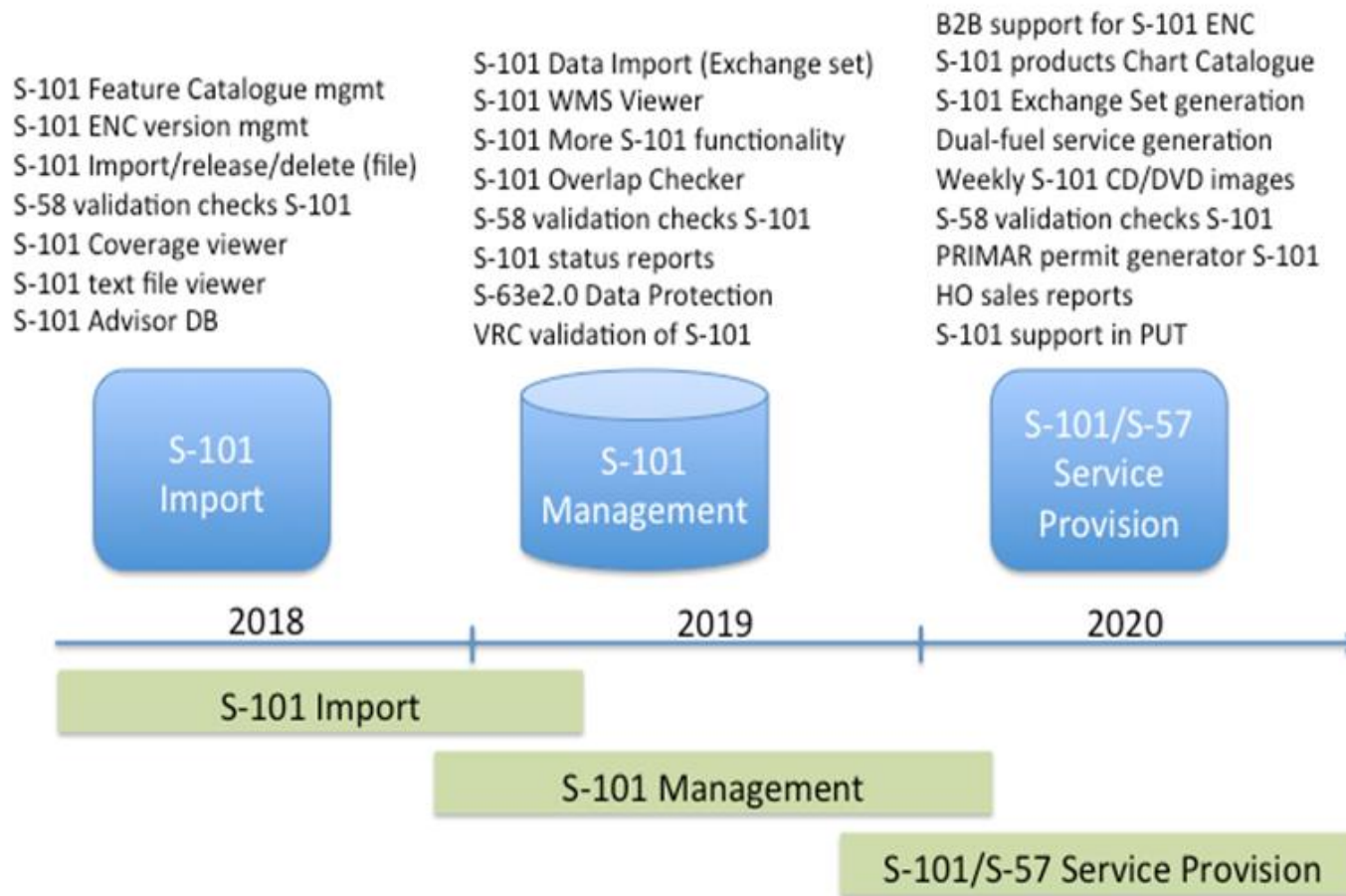
Sales



End-users

# PRIMAR S-101 Development

- PAC 24 approved S-101 development







**PRIMAR**<sup>®</sup>

# PRIMAR S-101 Development 2018

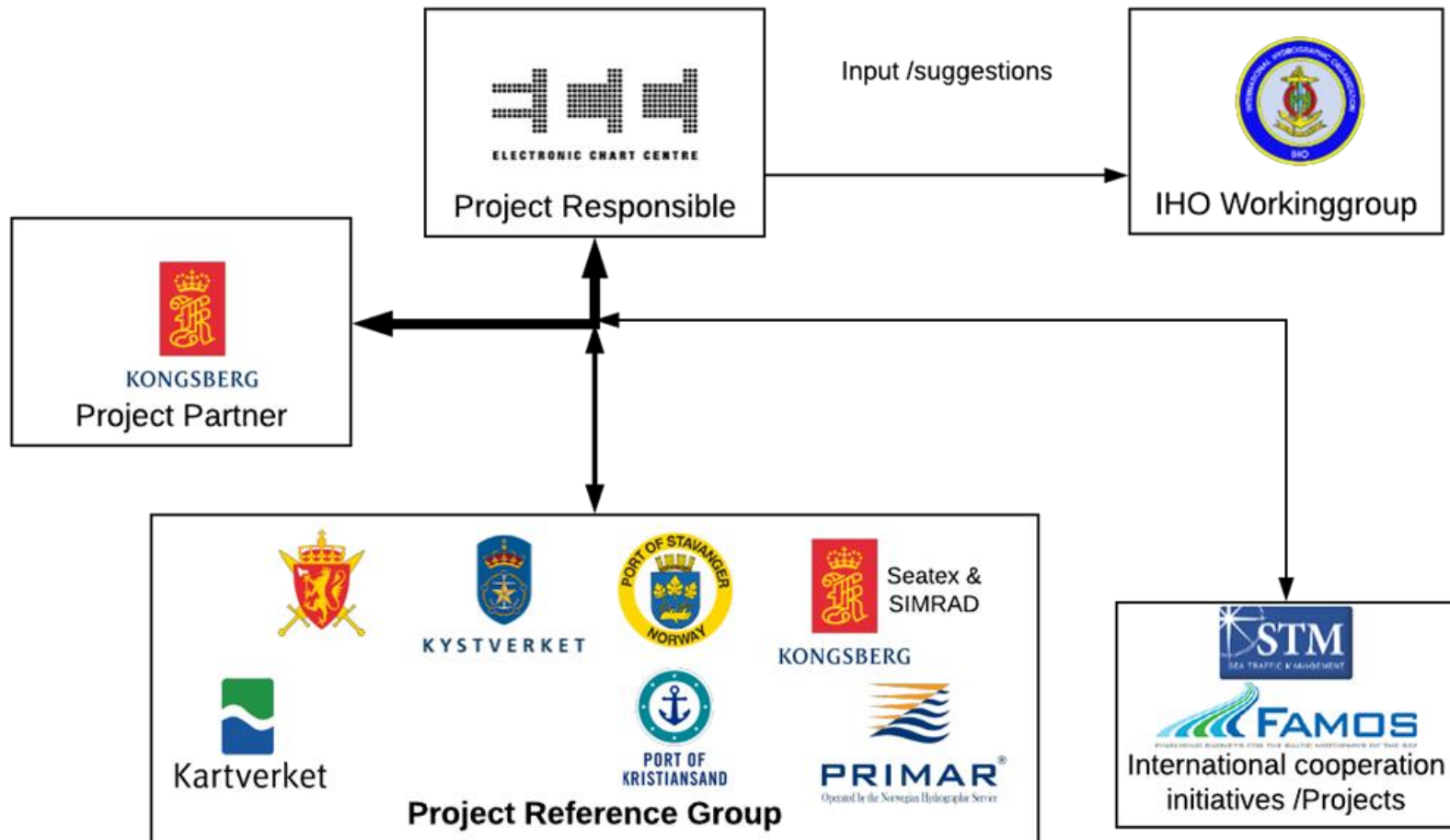
- Focus for 2018 has been on implementing support for the new S-100 data model in the PRIMAR database and core technologies.
- Challenge has been to obtain complete S-101 exchange sets for testing.
  - Only converted S-101 dataset files available.
- Expanded database design to support S-101 in co-existence with existing S-57 design and services to support dual-fuel.
- Developed functionality for importing S-101 datasets.
- Populate S-101 metadata based on information available in datasets.
- Started to build automatic S-101 validation tests.
- Started to build S-101 user interface for VPN functionality for import, manage/release, export.
- Started to develop support for S-100 (part 15) data protection applied to S-101 exchange sets.

# PRIMAR S-101 Development 2019

- Empower IHO to operate as protection scheme administrator for S-10x products.
- Complete VPN User Interface to import, manage and release S-101 datasets.
- Develop support for IHO Feature and Portrayal Catalogues.
- Develop S-101 Viewer.
- Develop S-101 Overlap Checker.
- Develop S-57/S-101 Comparison Viewer.
- Additional S-101 validation tests.
- Start development on Chart Catalogue with functionality to support S-101.
- Approach OEMs with PRIMAR plans and interfaces for providing S-57/S-101 dual fuel services.

# Research project - IHO S-100 portfolio

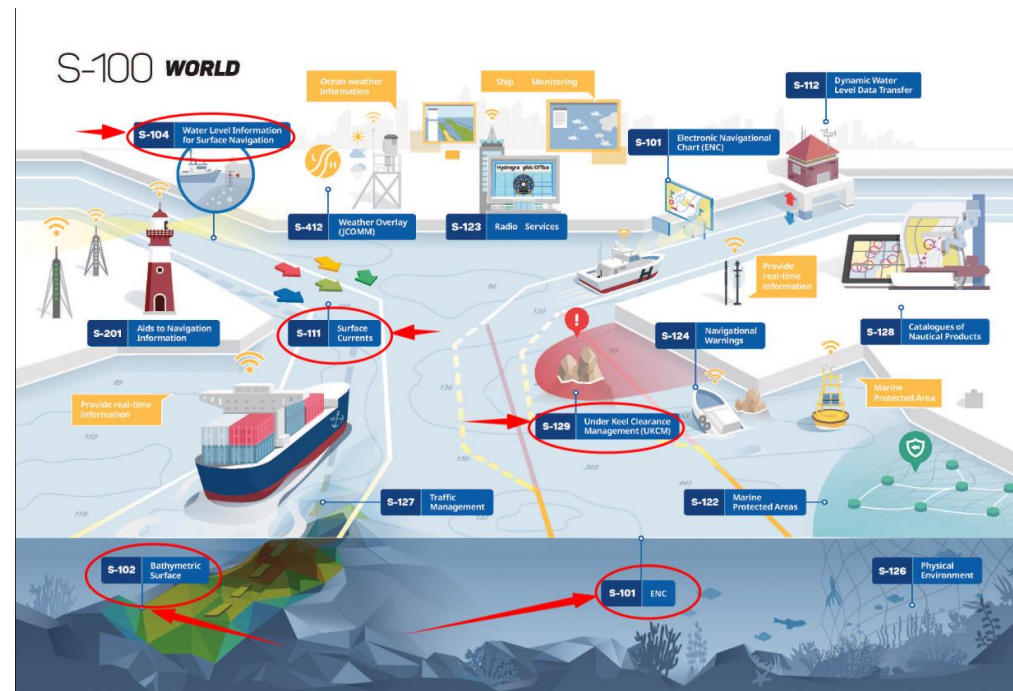
Feasibility study for the IHO S-100 portfolio.



# Research project - IHO S-100 portfolio

The S-100 standards scope for the project:

- S-101 (ENC)
- S-102 (Bathymetri)
- S-104 (Water Level information)
- S-111 (Surface Currents)
- S-129 (Under Keel Clearance)



Project timeline: 3 years

Project startup: April 2019



**PRIMAR®**

# Research project - IHO S-100 portfolio

## Project objectives:

- To define how the new standards, combined, can create value for the maritime industry and how new & improved products and business opportunities can be designed & developed based on the new standards.

## Expected outcome:

- In-depth knowledge on ownership, accessibility, quality and challenges related to the selected data types.
- Increased knowledge related to the value of combining data types.
- Competitive advantage.
- Valuable input and ability to impact final IHO S-100 standards.
- Contribute to product improvement and new products.



**Thank you for your attention**  
**Questions?**

**[www.primar.org](http://www.primar.org)**