S-100 Next generation of Dynamic Geospatial Navigation Services : The Full Value Chain

CHS / Teledyne Caris /SevenCs / PRIMAR / OneOcean / SEAiq / St-Lawrence River Pilots/
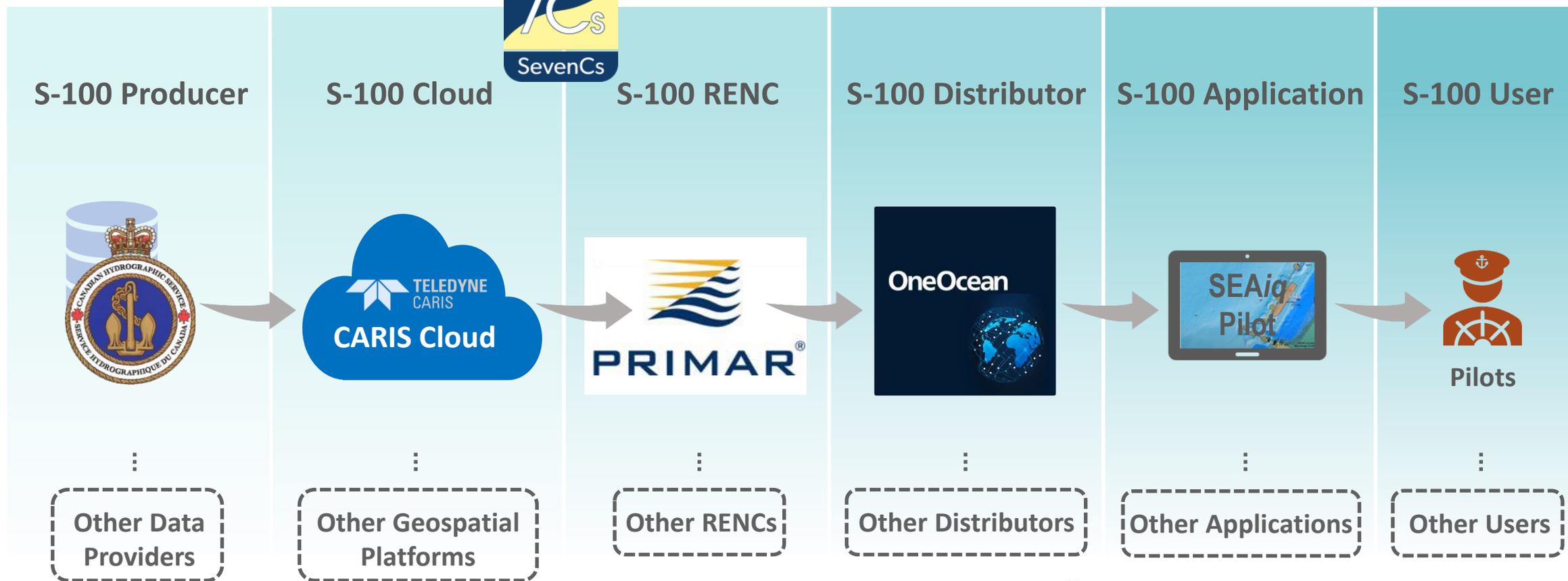
HSSC-13 Stakeholder Session

VTC

2021-05-05

S-100 Service – Full Value Chain

S-100 Service – Full Value Chain

S-100 Producer – Canadian Hydrographic Service

- From Static Product to Dynamic Subscription Service
- Challenging data management (numerous sources to one deconflicted service)
- Authority within the country (CHS = S-101 / S-102 / S-111 / S-104)
- Automated and timely updates
- Writing the book as we go.
- Backend big data analytics has potential

S-100 Cloud – Teledyne CARIS

- Technology partner for this new era of products and services through cloud services and infrastructure

- Built on 40 years of hydrographic survey, data management and chart production experience at hydrographic organizations around the world

- CARIS Cloud technology provides highly automated workflows that reduce the survey-to-bridge timeline

- Foundational technology for e-Navigation and autonomous shipping

- Positions Hydrographic Offices as leaders in the Blue Economy

CARIS Cloud Concept
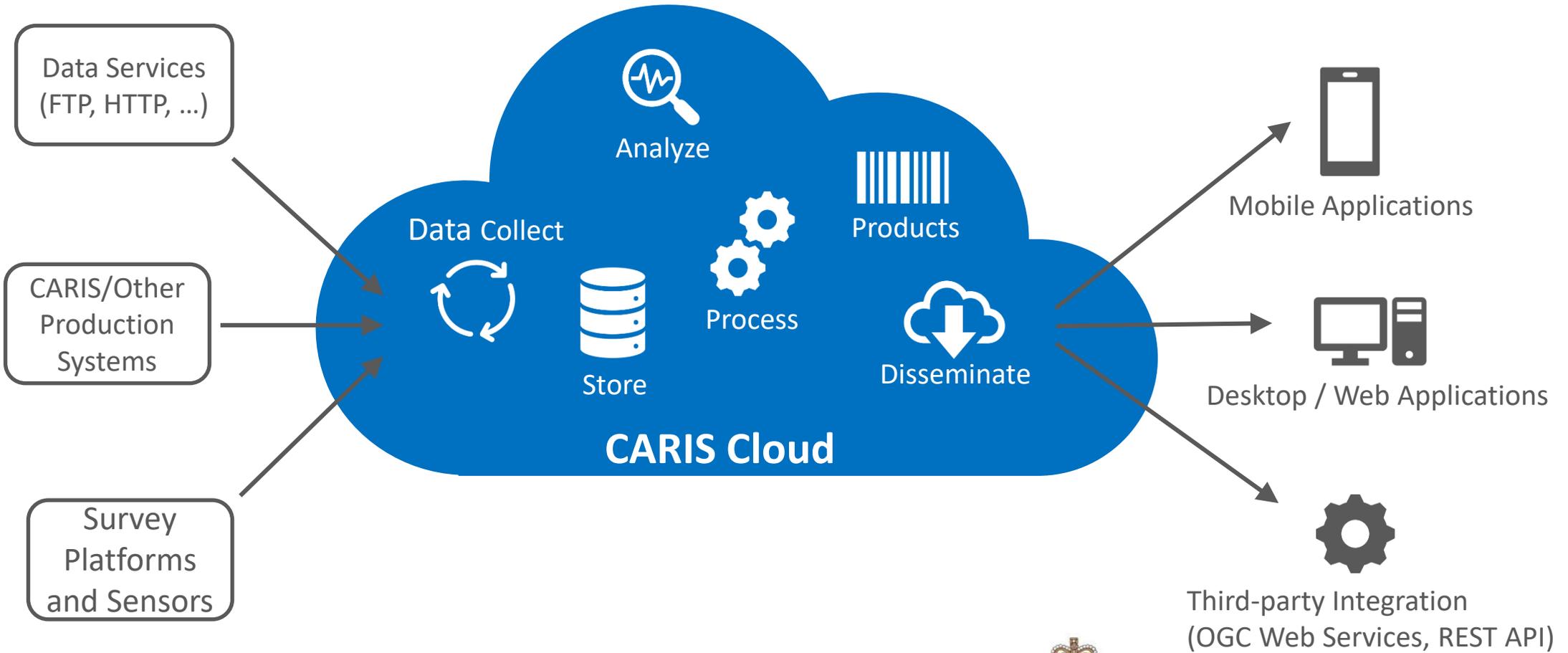
S-100 Cloud Features

- Scalable cloud platform for geospatial data

- Direct connection to CARIS HPD and BDB

- Get the most valuable data to market

- Share data easily with third parties and RENCs

- Teledyne CARIS maintains the Infrastructure

  - IT infrastructure

  - Cyber Security

  - Software and updates

  - Service Level Agreements

 - Analytics (usage patterns, AI)
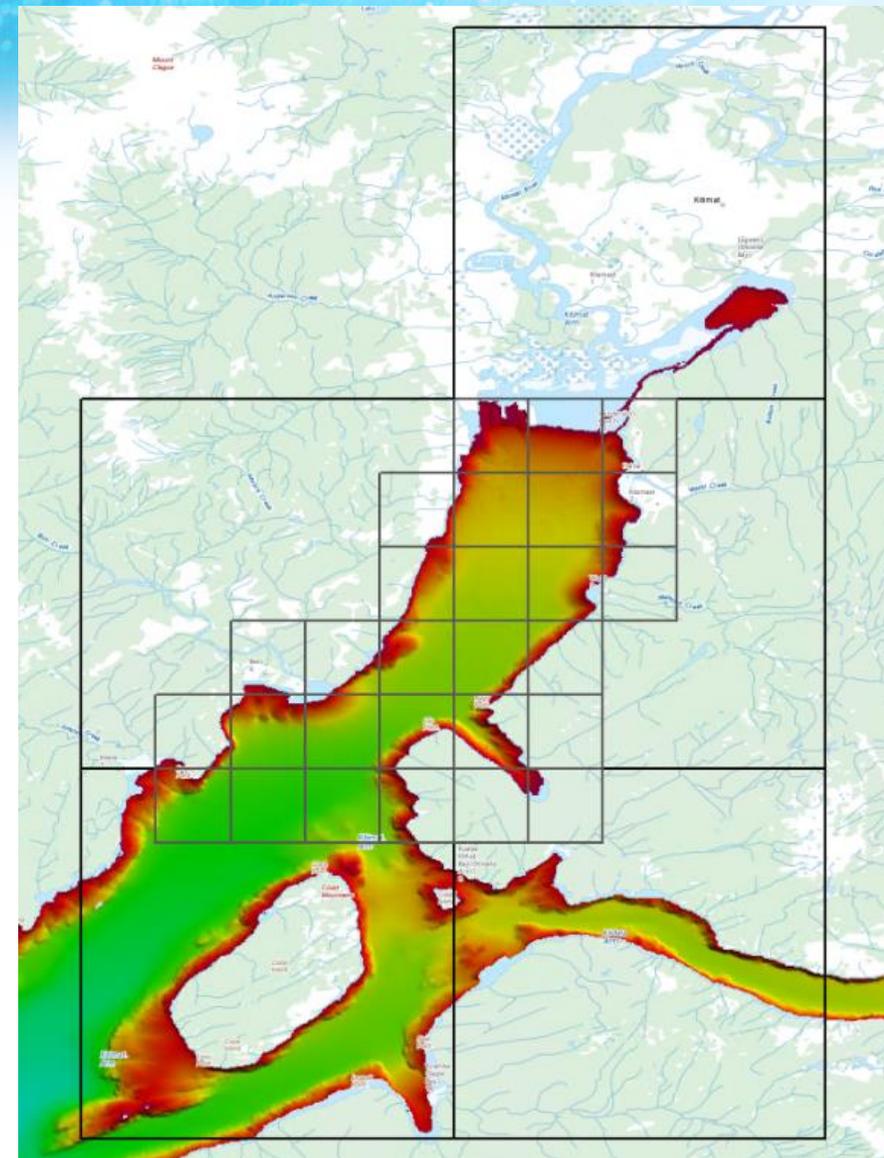
S-100 Validation – SevenCs / ND

- SevenCs has been developing ENC and ECDIS related solutions, services, and software for more than 3 decades.

- Product range includes chart production/validation software, ECDIS Kernels, Web Chart Solutions, Navigation Software (PPU,ECS).

- SevenCs belongs to the *ChartWorld International Group* of companies (major digital maritime-navigation provider).

- SevenCs and ND have teamed up to develop solutions and services for S-100 validation.

S-100 Validation - SevenCs
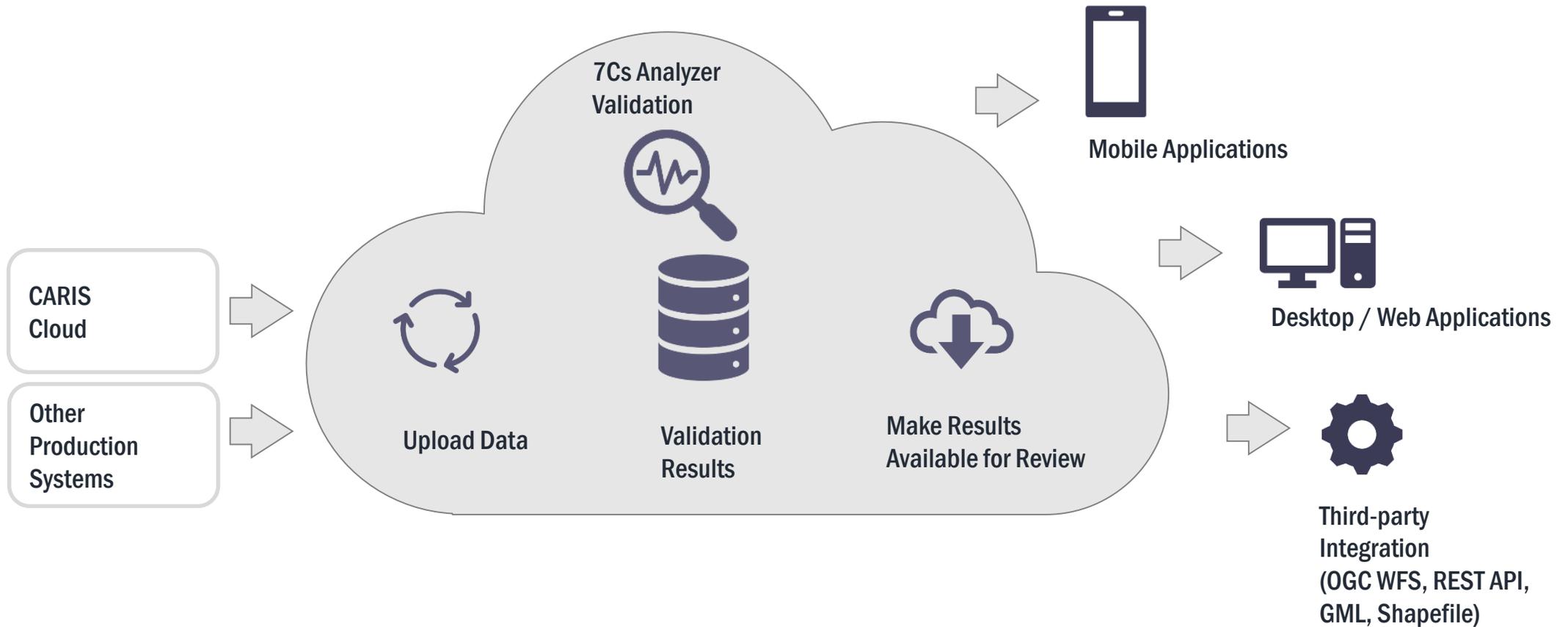
S-100 Validation - SevenCs

- Service oriented architecture that integrates with CARIS Cloud (or other production systems)

- Data is uploaded from CARIS Cloud

- Independent validation in accordance with IHO standards
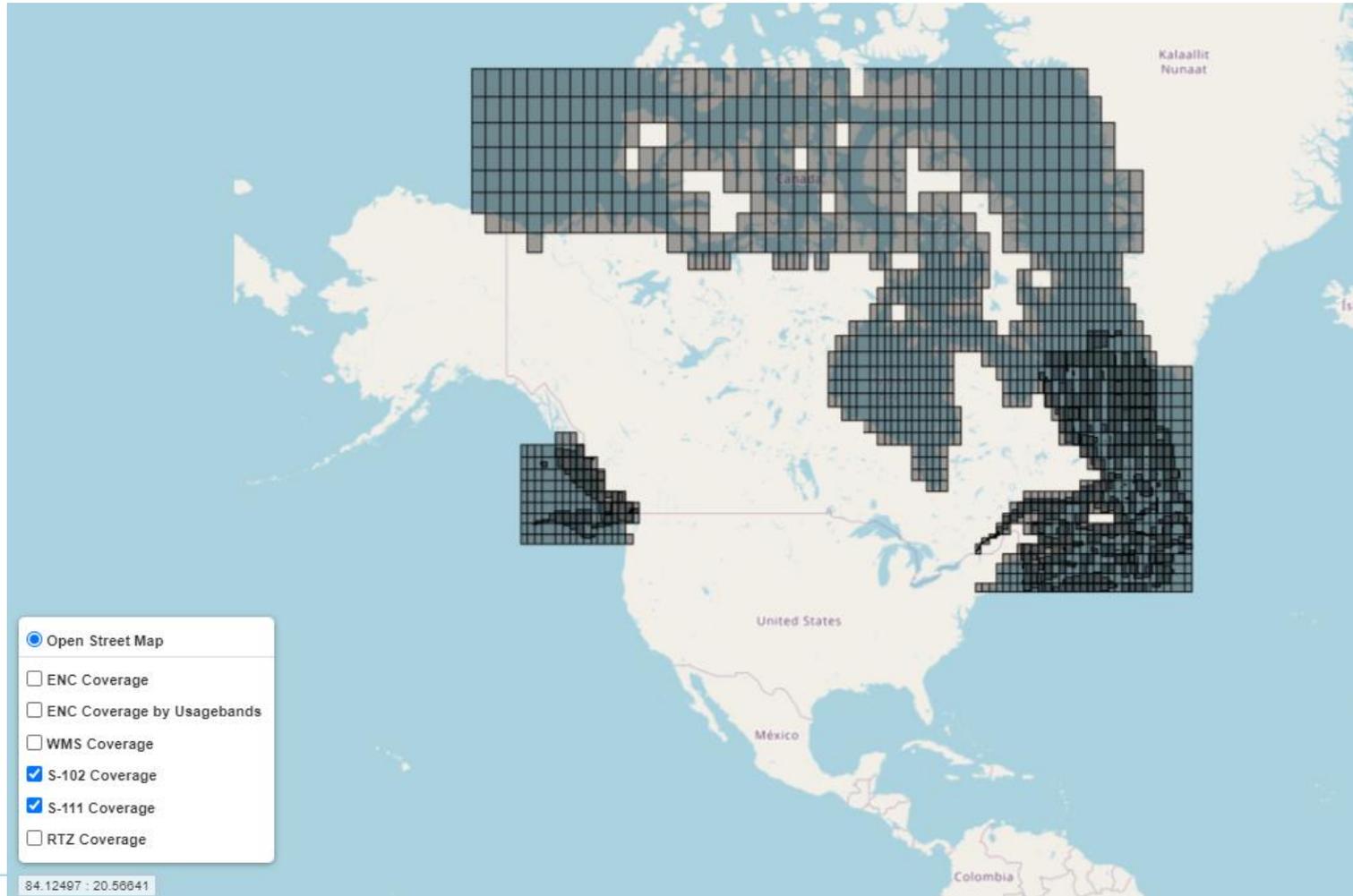 - S-101
  - S-102
  - S-104
  - …

S-100 Validation

- API offers simple pass/fail status, as well as detailed validation results as:
  - OGC WFS
  - GML
  - Shapefile
- Validation can be triggered automatically as dataset is imported into CARIS Cloud
- Results are made available for review and assessment

S-100 RENC – PRIMAR

S-100 Service Coverage

- PRIMAR Chart Catalogue
- 1265 S-102 datasets
- 1287 S-111 datasets

S-100 RENC – PRIMAR

- Automatic upload from Caris Cloud Service inclusive support for Virtual PRIMAR Network (VPN) upload.

- 12, 9, 6, 3 month subscriptions

- 3 month trail, R&D and 1 month Demo subscriptions

- S-100 Part 15 encryption

- Available via PRIMAR Online services (API)
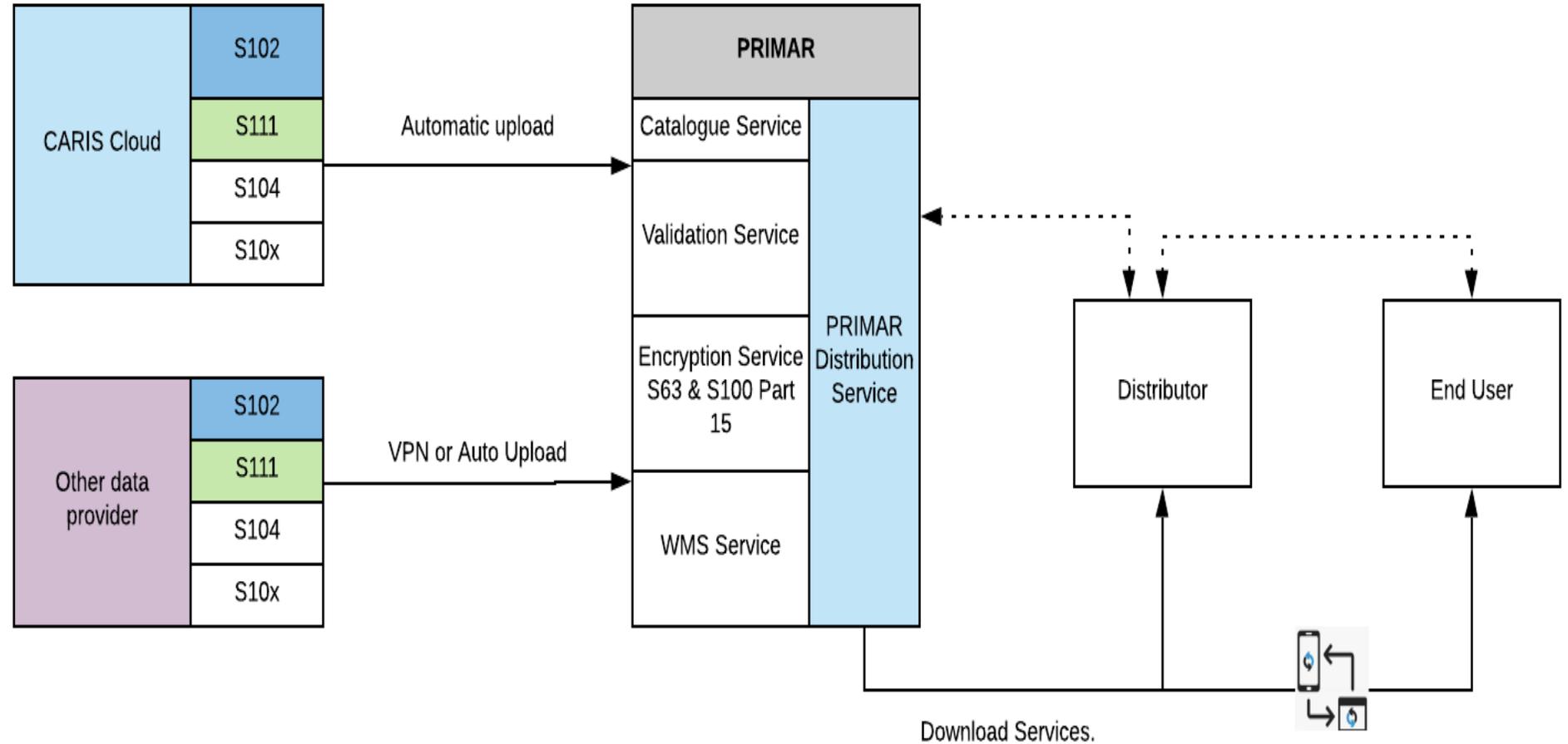
- S-104 data expected in the Service before end of 2021.

S-100 RENC – PRIMAR

PRIMAR S-100 Service

Automatic cloud upload or manual/auto VPN upload.

Updates are pushed automatically to the end user.

S-100 Distributor – OneOcean

PRIMAR subscription setup and assistance with coverage selection

Order processing via PRIMAR portal

PRIMAR subscription management and renewal

24/7 support with strong knowledge of SEAiq software

OneOcean fully supports the end user to ensure a seamless experience

S-100 Application – SEAiq Pilot

- Adopted by over 1/3 marine pilots world-wide
  - Lower St Lawrence Pilots, Atlantic Pilotage Authority
  - London, Hamburg, Miami, Los Angeles, Singapore…
- S-100 series products developed in cooperation with CHS and CPBSL pilots
- S-102 (completed 2020)
  - Vector and Raster presentation
  - Set contours and intervals to any depth
  - Chart adapts to mariner's needs
  - Overlays ENC features (ATON, etc) on bathymetry
- S-111 (current) and S-104 (water level) completed 2021
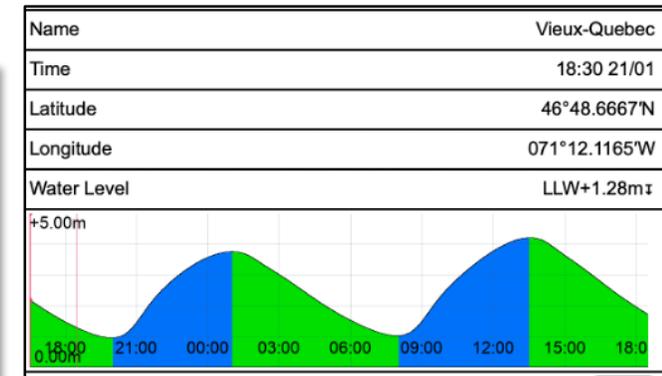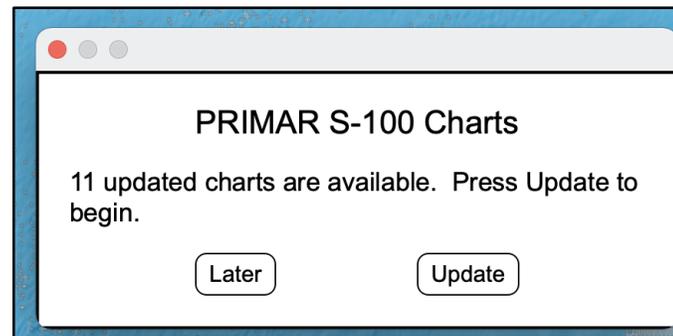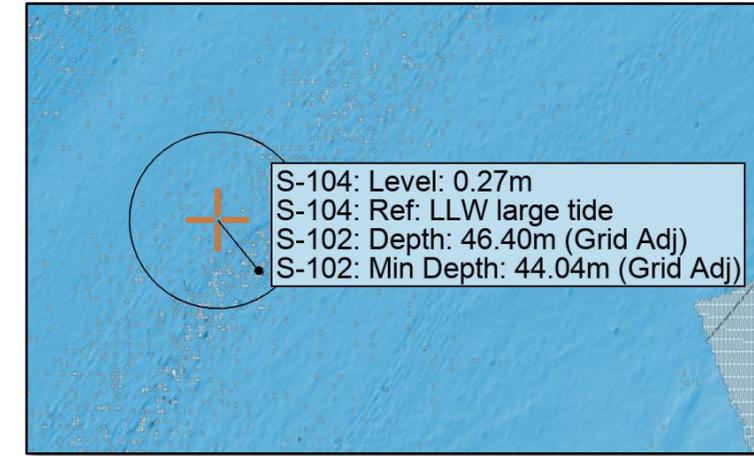- Automatic download and update from PRIMAR

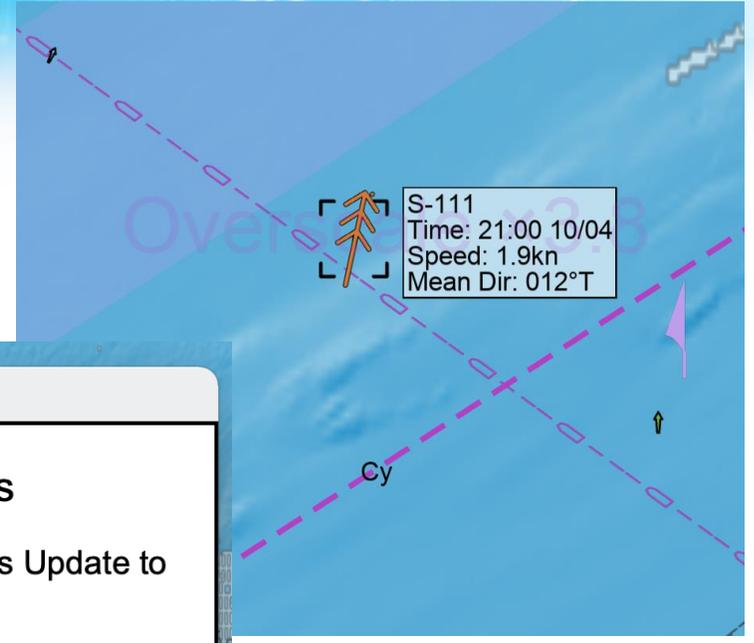# S-100 Application – SEAiq Pilot (S-102)
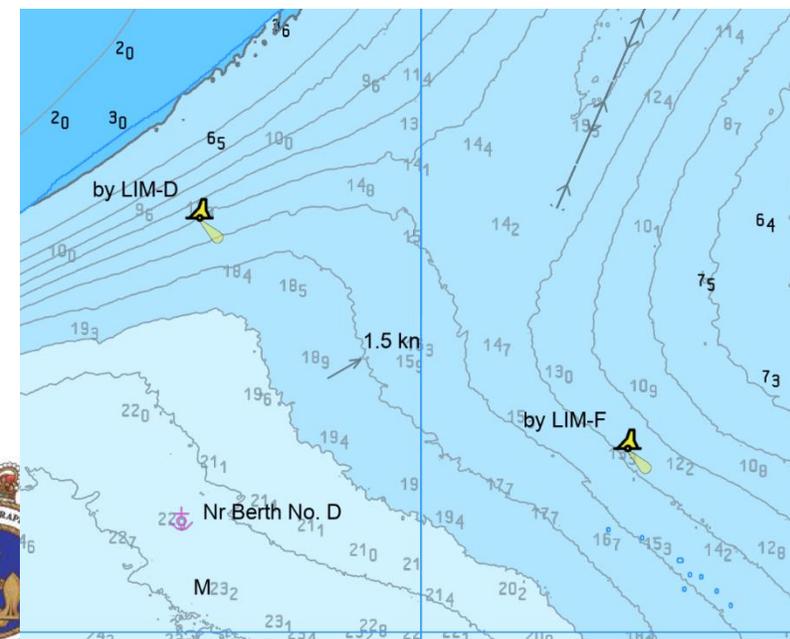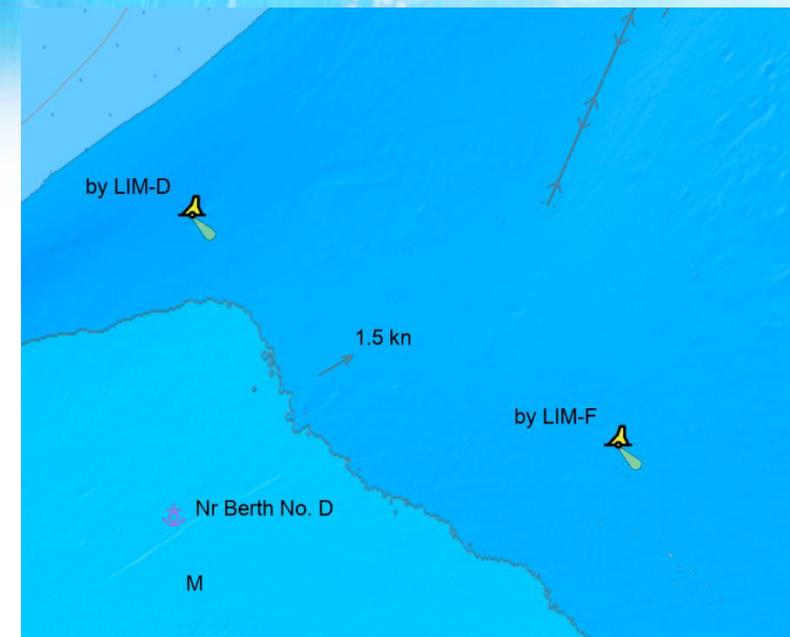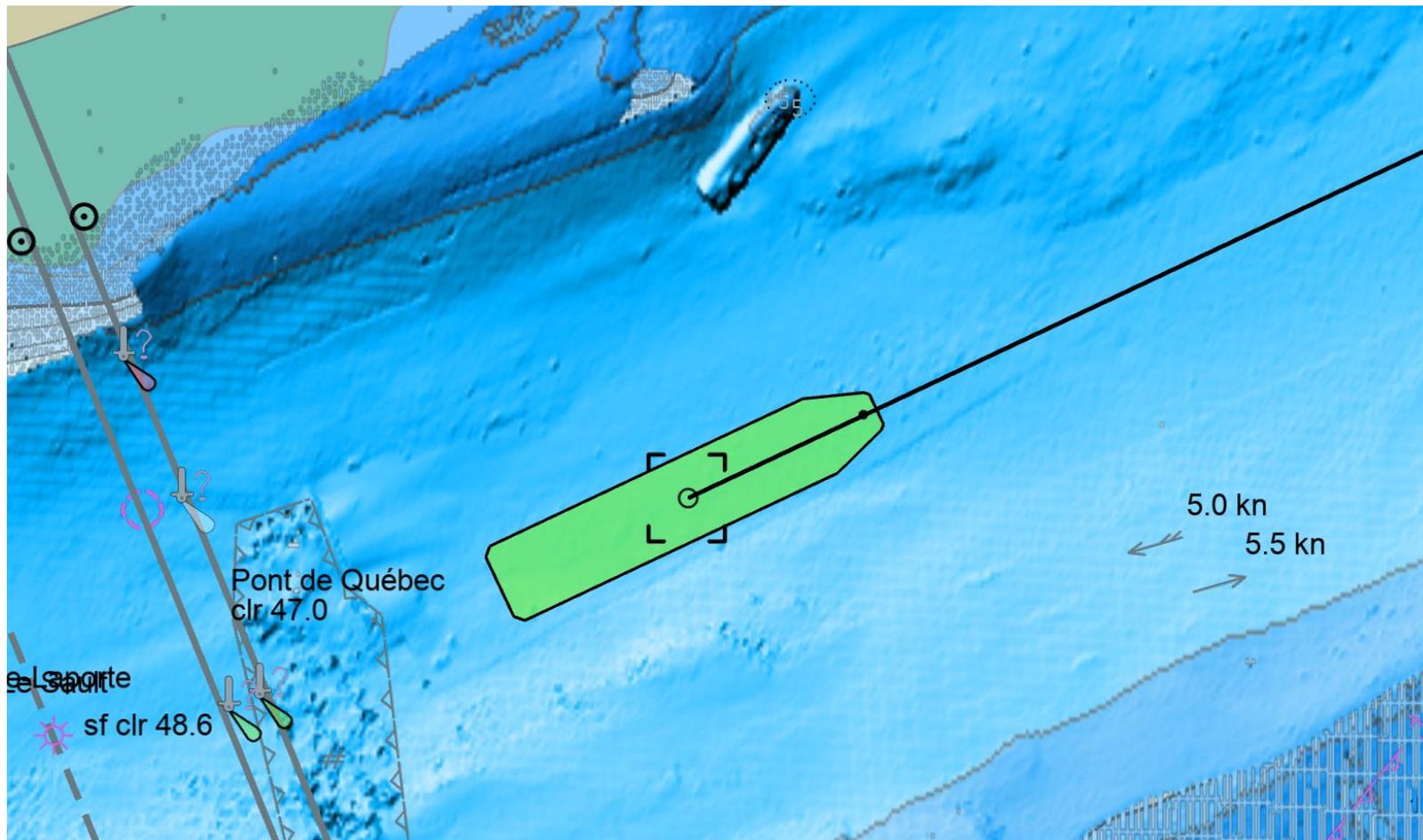
S-100 Application – SEAiq Pilot (S-104 & S-111)

- Gridded & Point data
- Real-time data probe
- Automatic water level adjustment for S-102
- Slider to browse time
- Automatic PRIMAR download/update
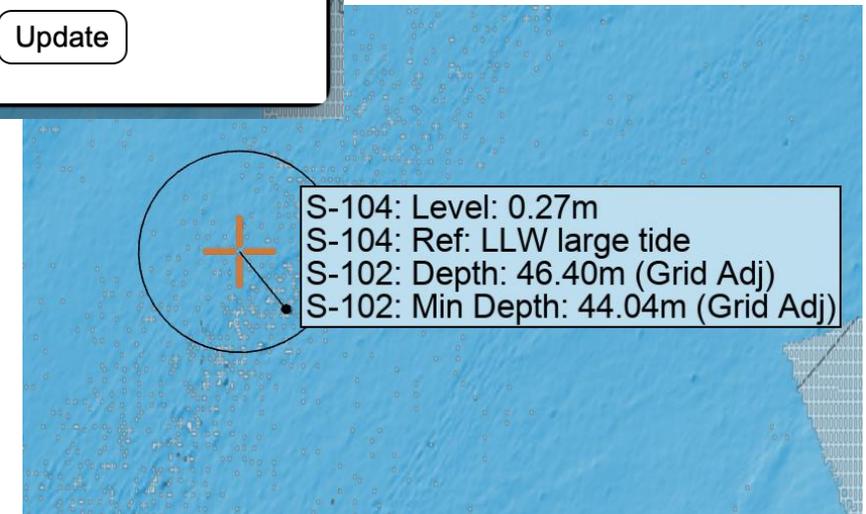- Future: Use currents to adjust predictions

S-100 Application – SEAiq Pilot

S-100 Users –
Lower Saint Lawrence River Pilots

The Project

- Sea trials: over 1,000 hours, still ongoing.

- Various ships of different sizes, drafts, and equipment under varying weather conditions
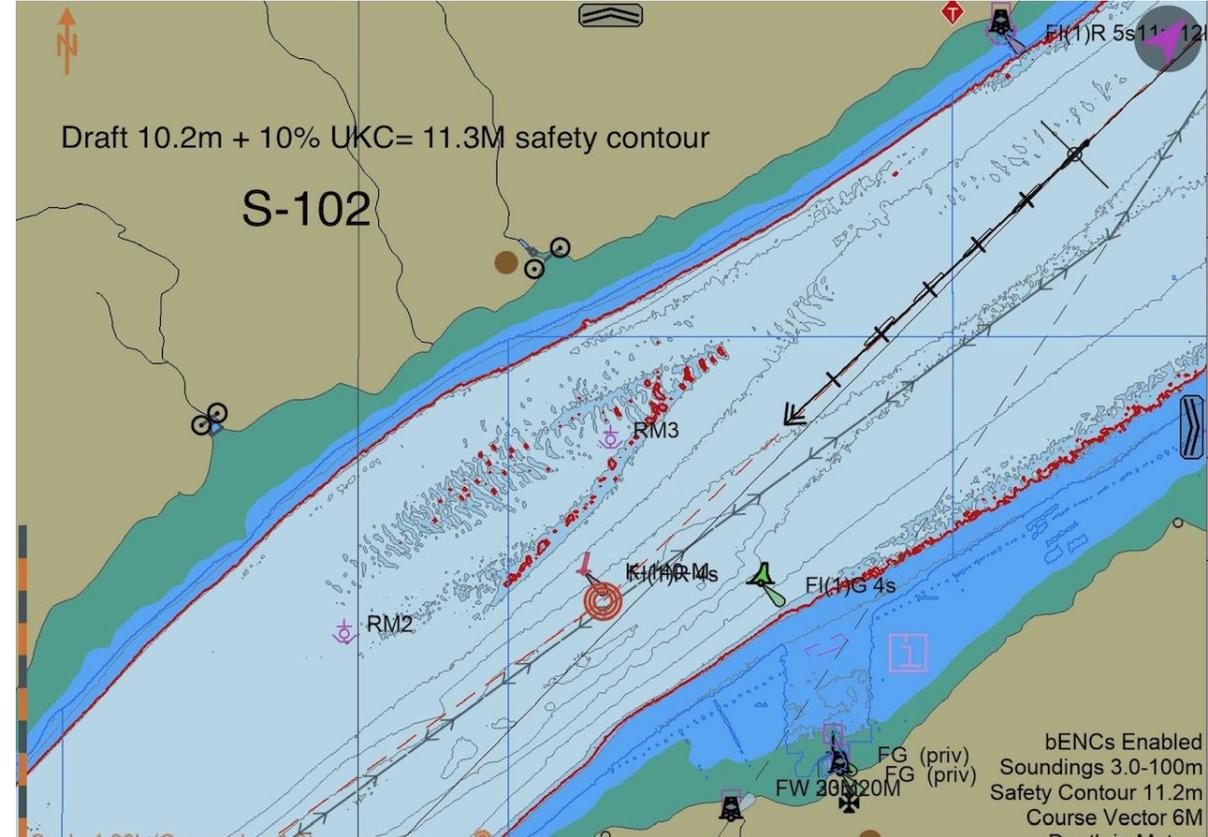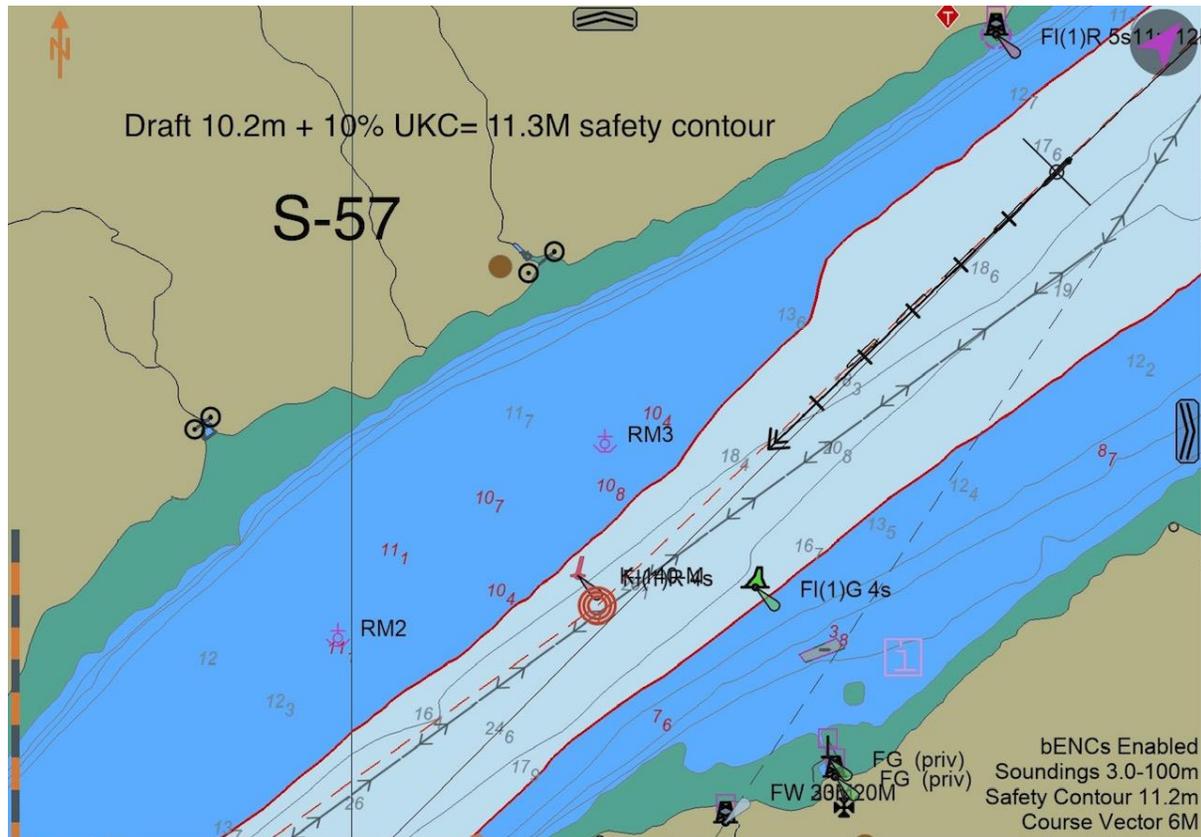
Objective:

- To develop a navigator-friendly product

Piloting with S-102
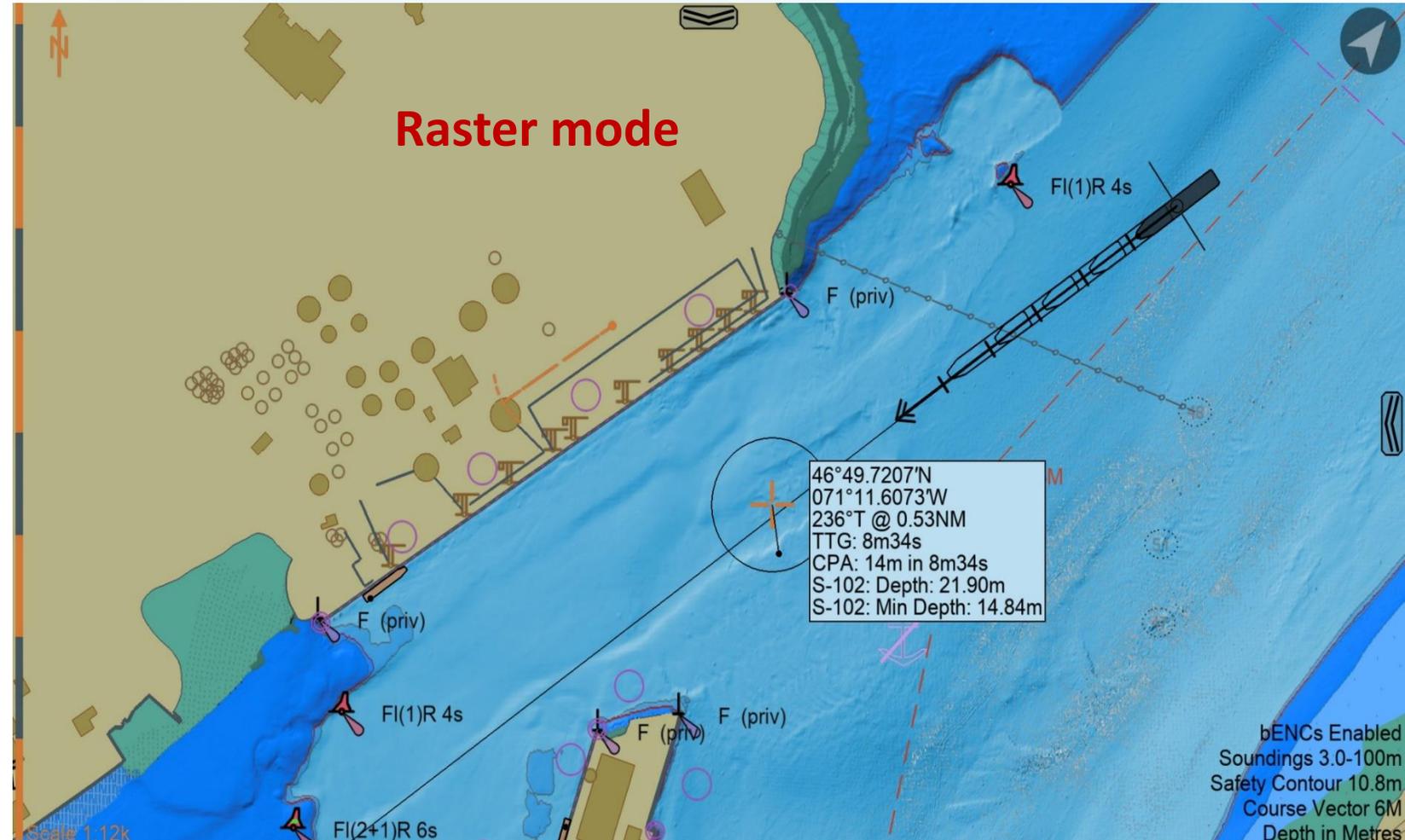## Static vs Dynamic
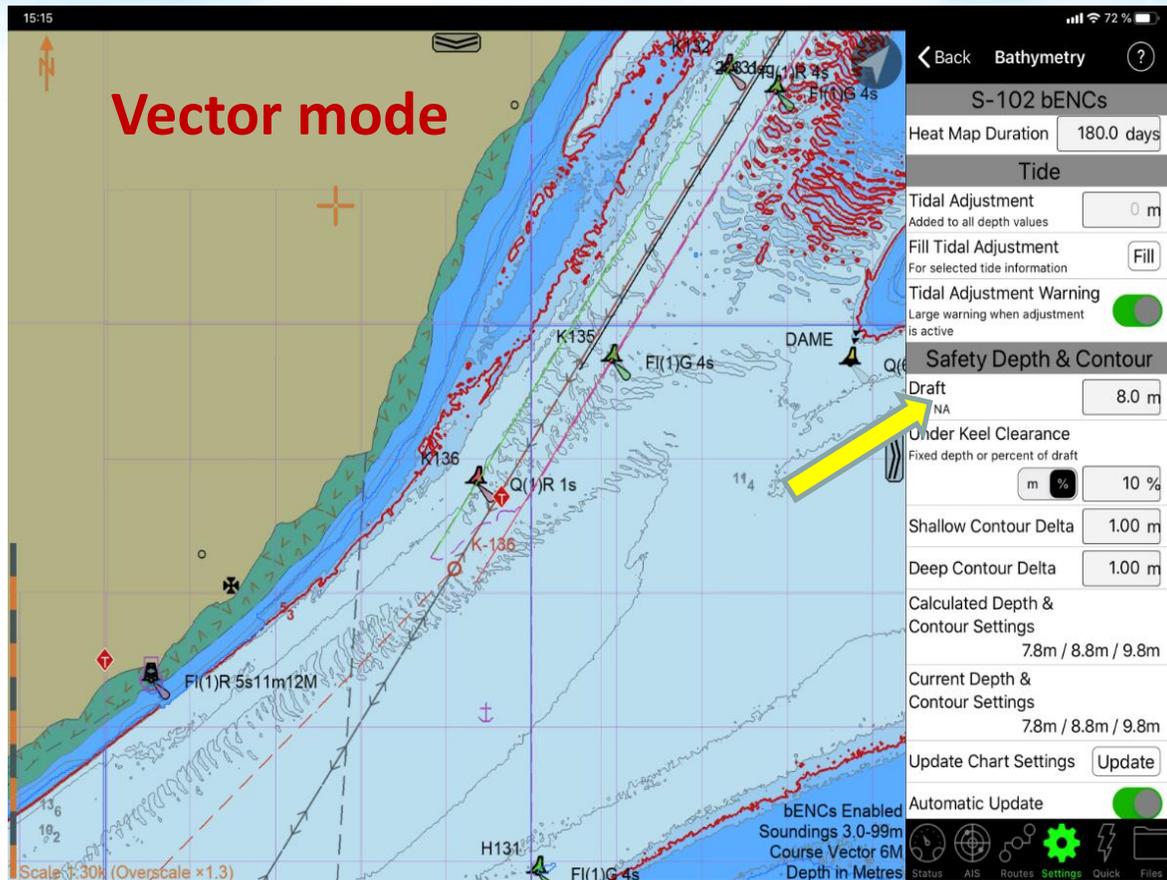

Better situational awareness = increased navigational safety

Piloting with S-102

Improvements:

- Visual display of objects and navigational aids
- Depth query cursor
- Heat map (update tracking)

Raster mode

Fl(1)R 4s

F (priv)

46°49.7207'N
071°11.6073'W
236°T @ 0.53NM
TTG: 8m34s
CPA: 14m in 8m34s
S-102: Depth: 21.90m
S-102: Min Depth: 14.84m

F (priv)

Fl(1)R 4s

F (priv)

F (priv)

Fl(2+1)R 6s

Scale 1:12k

bENCs Enabled
Soundings 3.0-100m
Safety Contour 10.8m
Course Vector 6M
Depth in Metres

Piloting with S-102

Vector mode

- Safety contour adapting to ship's draft
- Voyage planning & contingency plans
- Dynamic tidal adjustments
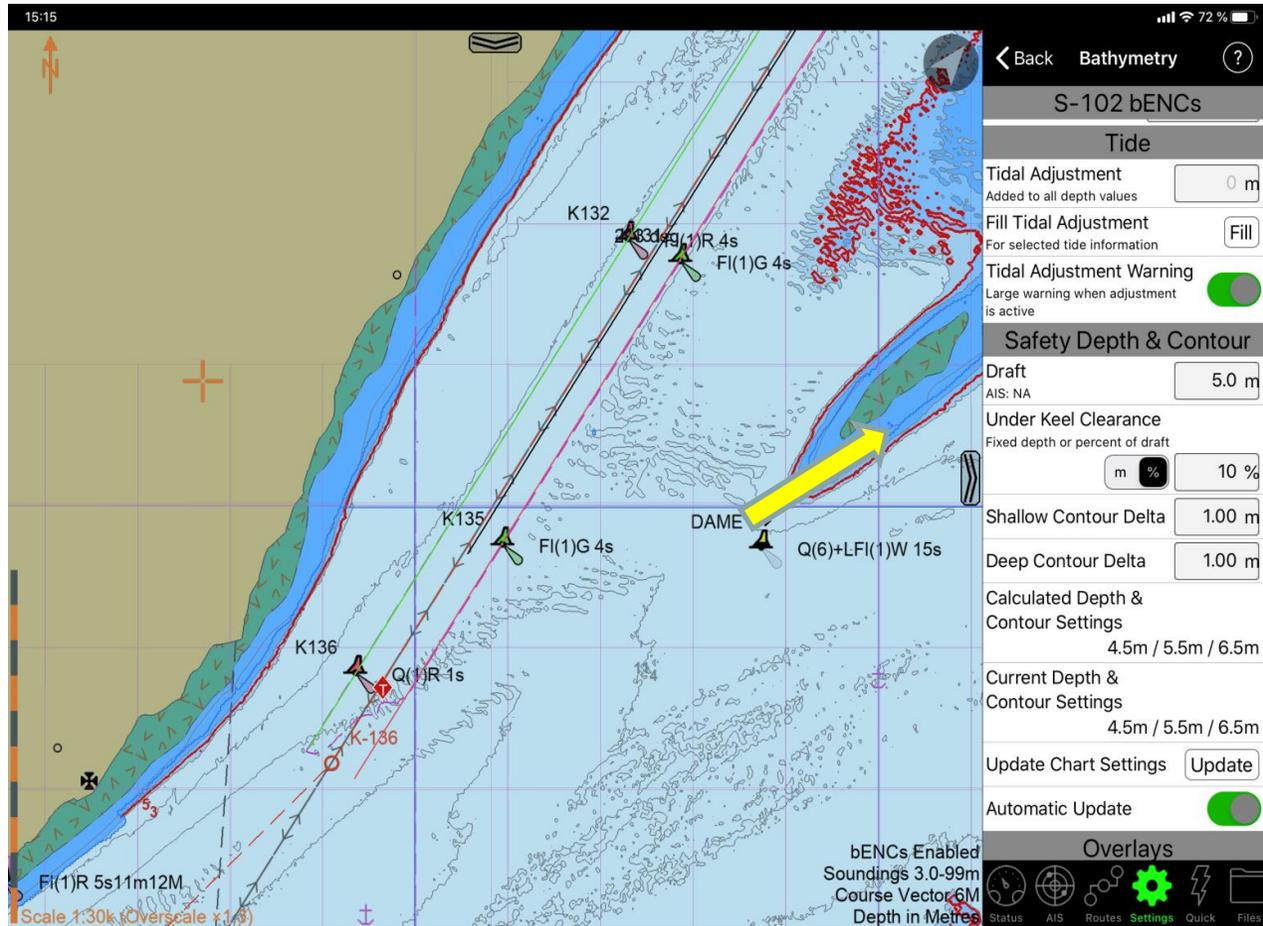
Looking Forward

- National - International Community engagement

- Full 4 Dimension Service

- Number of potential Geospatial Apps are endless

- Hydrography has a huge role to play to create a dynamic digital twin of oceans

- 2 way communication, floating assets to feed observation back to forecasting system (Real-time data assimilation)

- S-100 services will enable E-nav, autonomous technologies and dynamic digital twin...

Questions