Trends in Hydrography & New Teledyne CARIS Solutions

Charles de Jongh - Teledyne CARIS

7th RSAHC Meeting – Muscat, Oman – 20-22 February 2017

CARIS Ping-to-Chart Workflow

TELEDYNE CARIS
Everywhereyoulook™

CARIS Ping-to-Chart Workflow

INPUT

Raw Sonar Data

PROCESSING

- HIPS and SIPS
- Onboard

Processed Terrain Models & Point Clouds

ANALYSIS

- Bathy DataBASE
- BASE Editor
- Engineering Analysis Module
- LOTS

Contours & Features

PRODUCTION

- HPD
- S-57 Composer
- Paper Chart Composer

Nautical Chart

DISCOVERY

- Spatial Fusion Enterprise

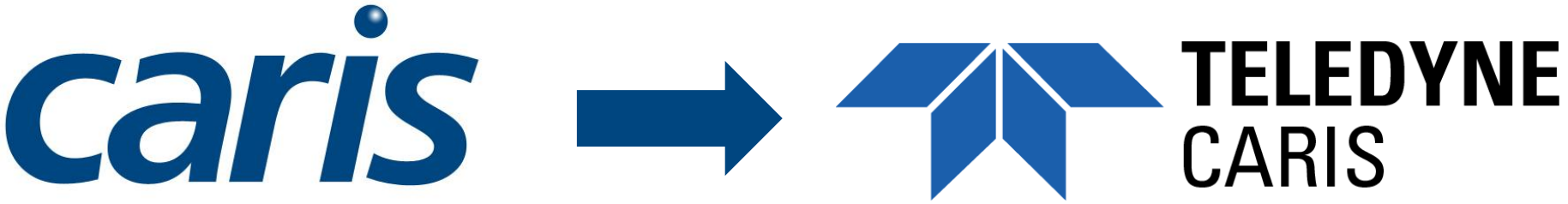
OUTPUT

Web Distribution

PROCESS AUTOMATION

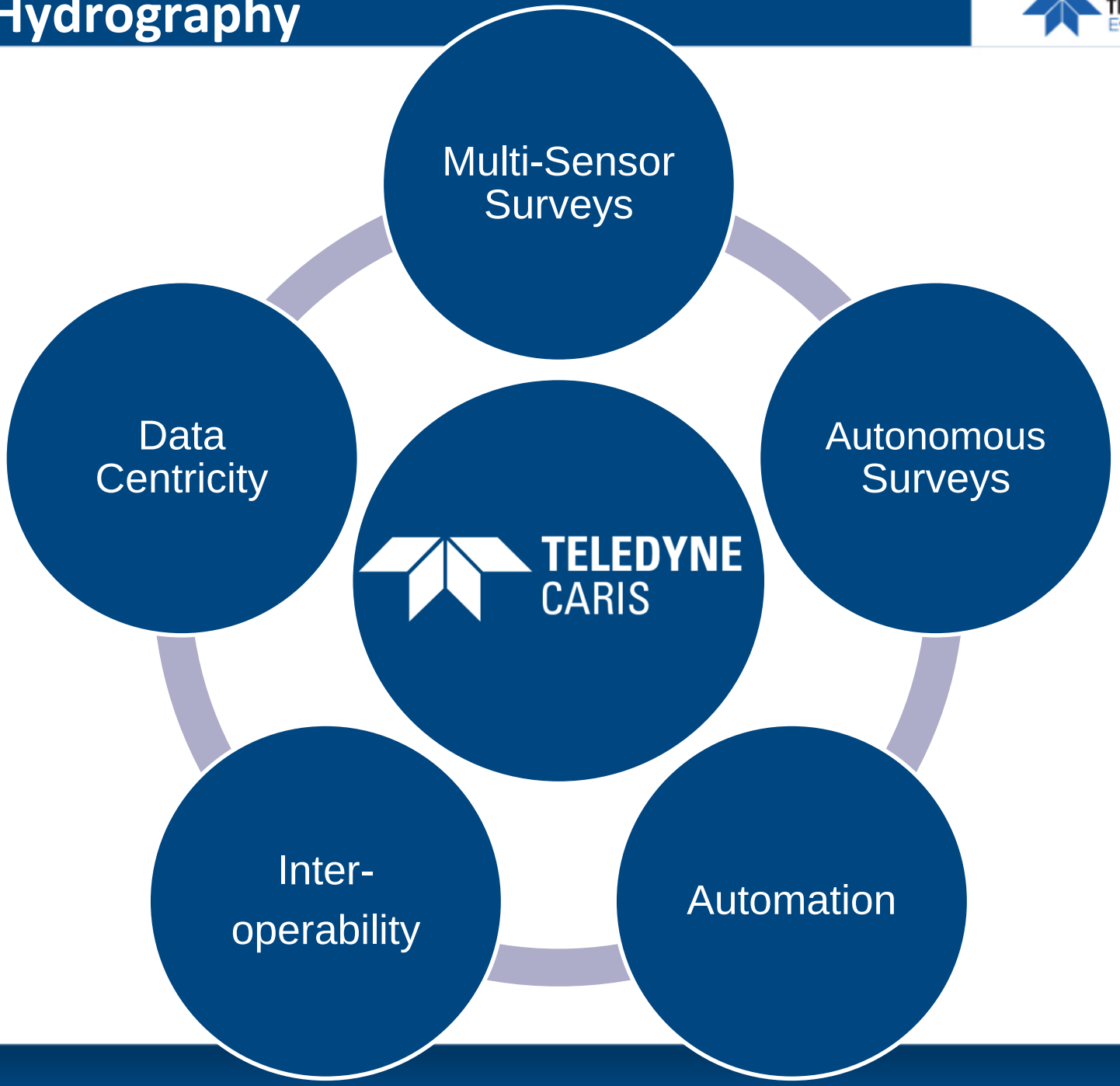
Fredericton – Canada • 's-Hertogenbosch – The Netherlands • Alexandria – United States • Milton – Australia

Teledyne acquired CARIS



- Teledyne Technologies acquired CARIS in May 2016.
- Teledyne CARIS will continue to support the entire hydrographic workflow.
- Teledyne CARIS will broaden its support for a wide range of sensor systems and data standards across the hydrographic industry.

Trends in Hydrography



Multi-Sensor Surveys

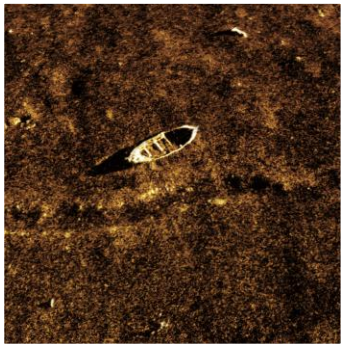
- The surveyors toolbox is constantly expanding & sensors are getting better

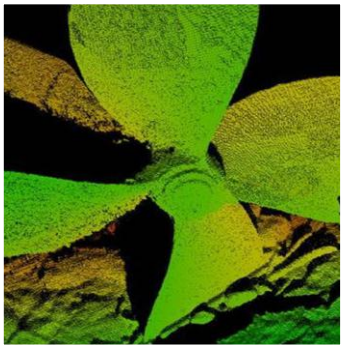
- Three categories of sensors: sound, light & location

- CARIS needs to be able to process, combine and analyze the data acquired by many different sensors.

Sound

- Multibeam
- Side scan
- SAS
- Imaging sonar





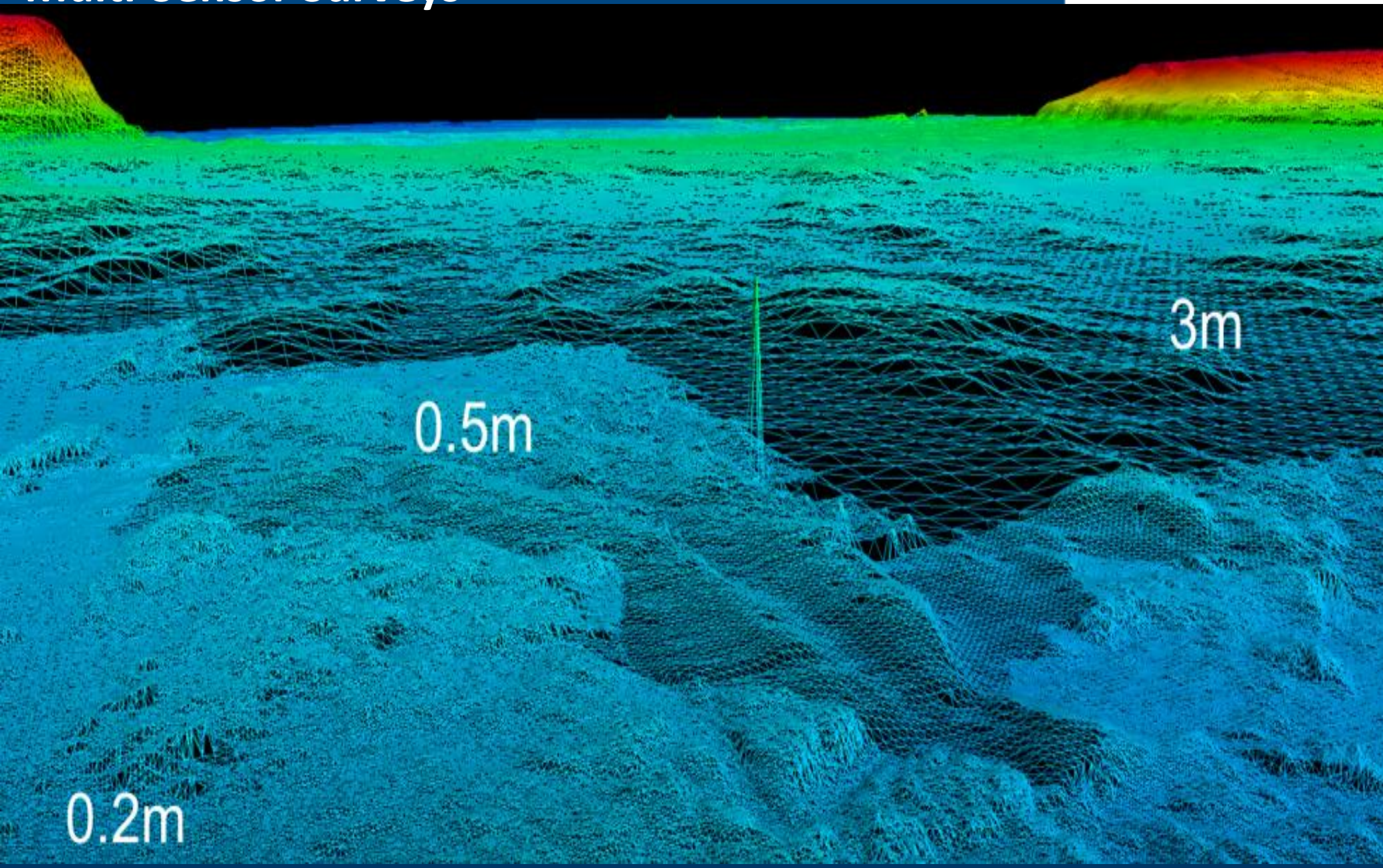
Light

- Laser scanner
- LiDAR
- Camera
- Underwater laser

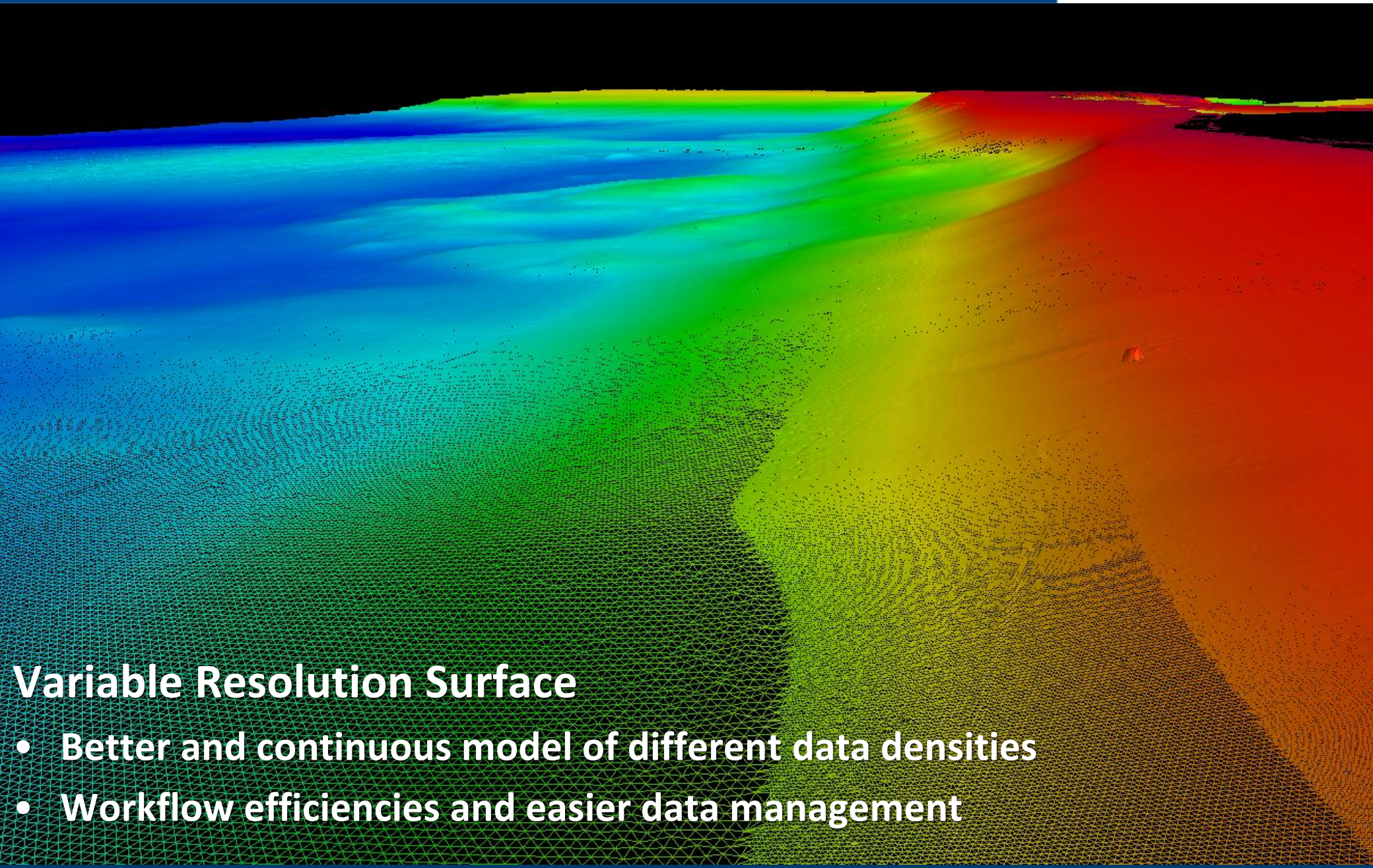
Location

- GNSS
- INS
- USBL

Multi-Sensor Surveys



Variable Resolution Surfaces



Variable Resolution Surface

- Better and continuous model of different data densities
- Workflow efficiencies and easier data management

Autonomous Surveys

- Autonomous Survey Operations have increased over the past 5 years.
- Benefits are lower operating costs, rapid deployment/recovery, ability to work closer to the intended target.
- Expectation: more vehicles, better sensors & batteries: much more data!
- Survey Data stored internally and processed post mission
- Creating a **data processing bottleneck**

Autonomous Surveys

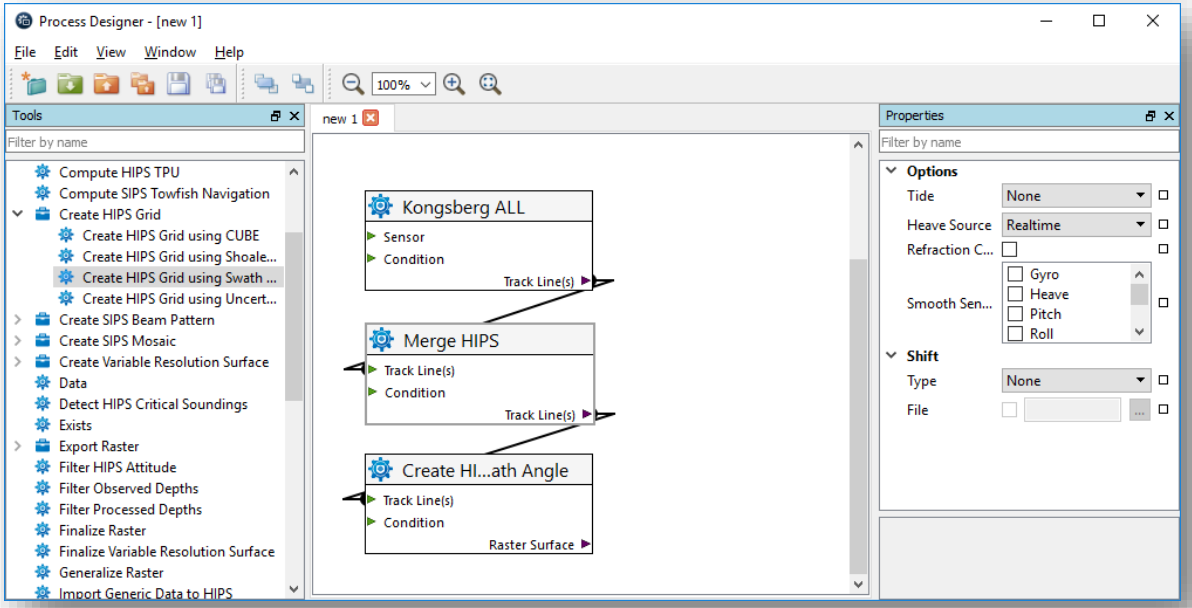
TELEDYNE CARIS
Everywhereyoulook™

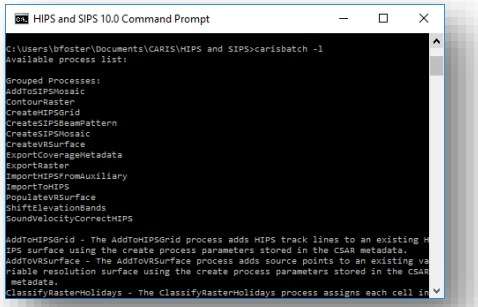
- Automated solution to overcome processing bottleneck: postprocessing done on board of autonomous vehicle.
- Deployed on computer on survey launch or autonomous vehicle payload
- Provides near real-time seafloor mapping
- Built using proven CARIS HIPS and SIPS algorithms and expertise
- Supports optimal use of human resources
- Provides time savings to reduce Ping-to-Chart timeline

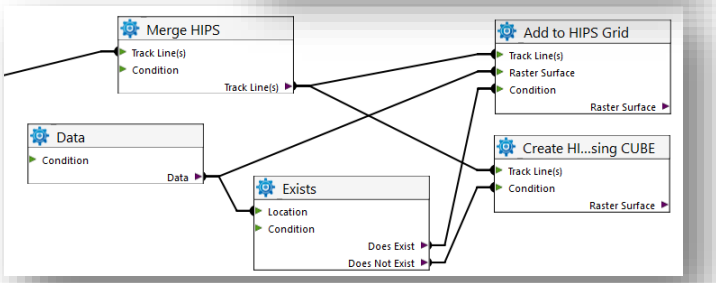
caris ONBOARD

Process Designer

- Define custom or standardized workflows to improve repeatability and quality of results
- Completely automate the processing of bathymetry and imagery data, and creation of multiple deliverables, to support various applications while reducing costs.

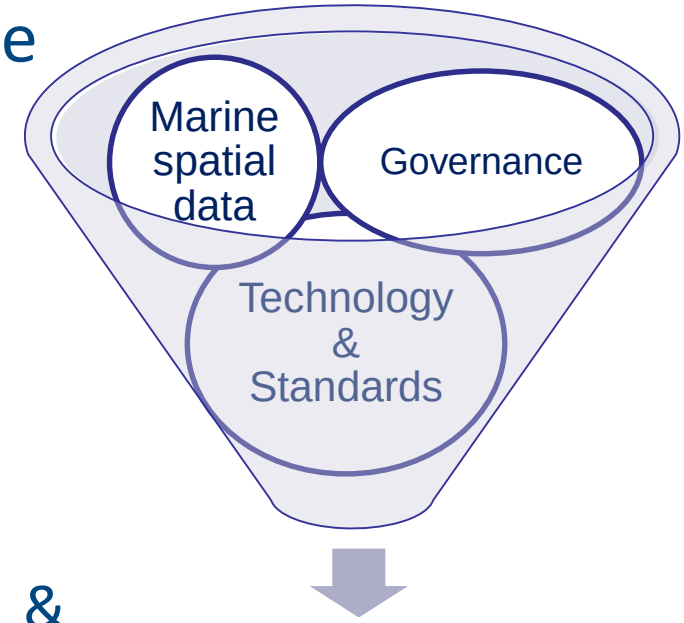






Interoperability

- Hydrographic offices need an interoperable approach to maximize value from marine spatial data.



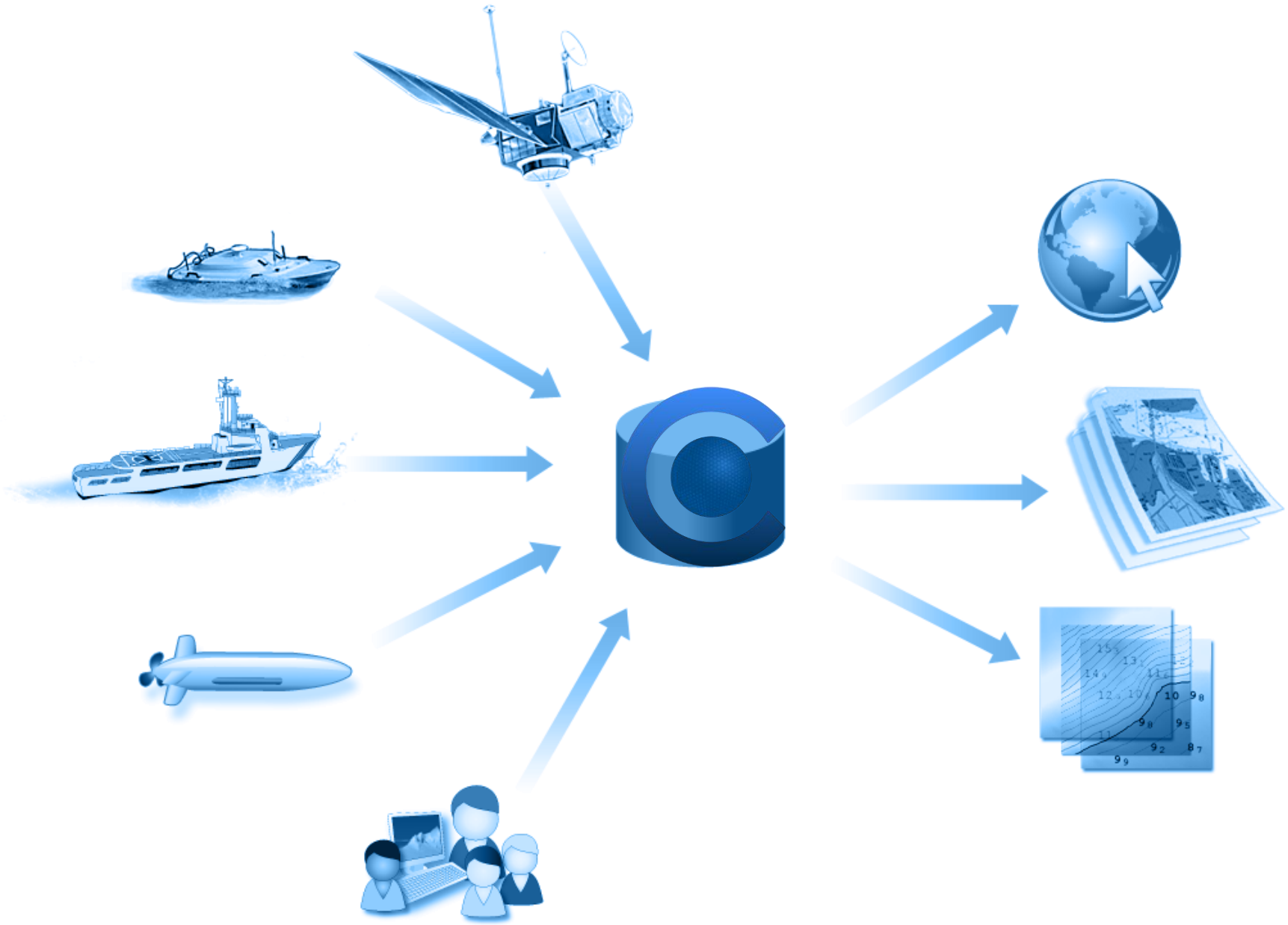
- IHO S-100 Development
  - 'Beyond the scope of traditional hydrography'
  - CARIS supports S-100 Development, e.g. S-101 & S-102

- Open Geospatial Consortium (OGC) and IHO cooperation.
  - MOU established
  - OGC Marine Domain Working Group Established

Data Centricity

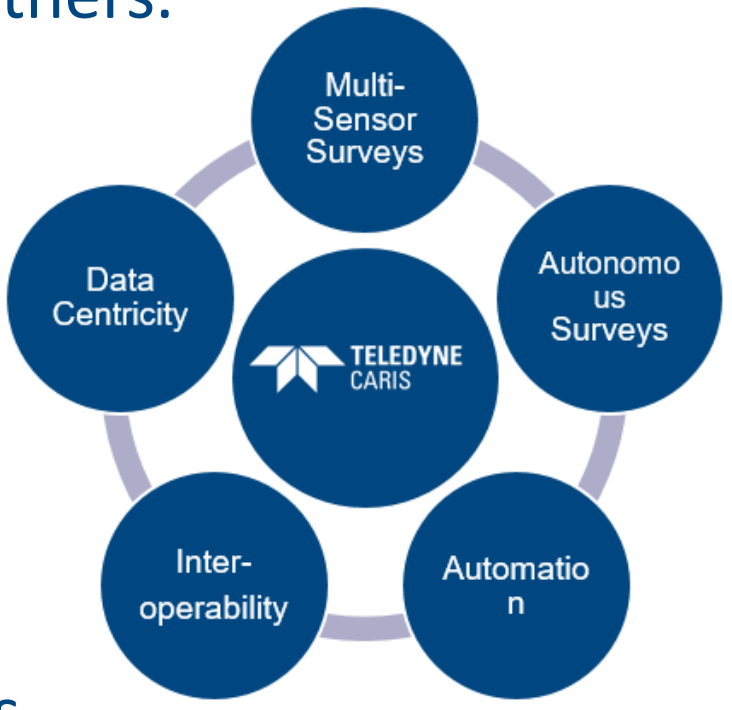
- Many geospatial organizations are looking into data centric workflows and management
- To transition **from chart producer to marine data provider**
- To support a broader user base
  - Supports open data and national SDI initiatives
- To realize efficiencies
  - Collect once use many times
  - Ad hoc products and services
  - Increased automation in processing and product compilation

Inputs and outputs in a data centric workflow



CARIS Technology Vision

- CARIS Supports Data Centricity
- Enhance support for a wide range of sensors.
- Enable users to efficiently provide standardized and ad-hoc products for the marine community & others.
- Modularity & Interoperability:
  Products share technology and data using IHO/OGC/ISO standards.
- Focus on automation
- Enable workflow efficiencies for all users



CARIS 2017 Conference

- Join us in celebrating 150 Years of Hydrography and Geomatics in Canada's Capital in an atmosphere of community for CARIS Software users – new and old.

- CARIS 2017 represents a cost effective training opportunity, includes interactive user group sessions and provides a venue for sharing knowledge and techniques