SOUTHERN AFRICAN & ISLANDS HYDROGRAPHIC COMMISSION

TELEDYNE CARIS

Everywhereyoulook™

Part of the Teledyne Imaging Group

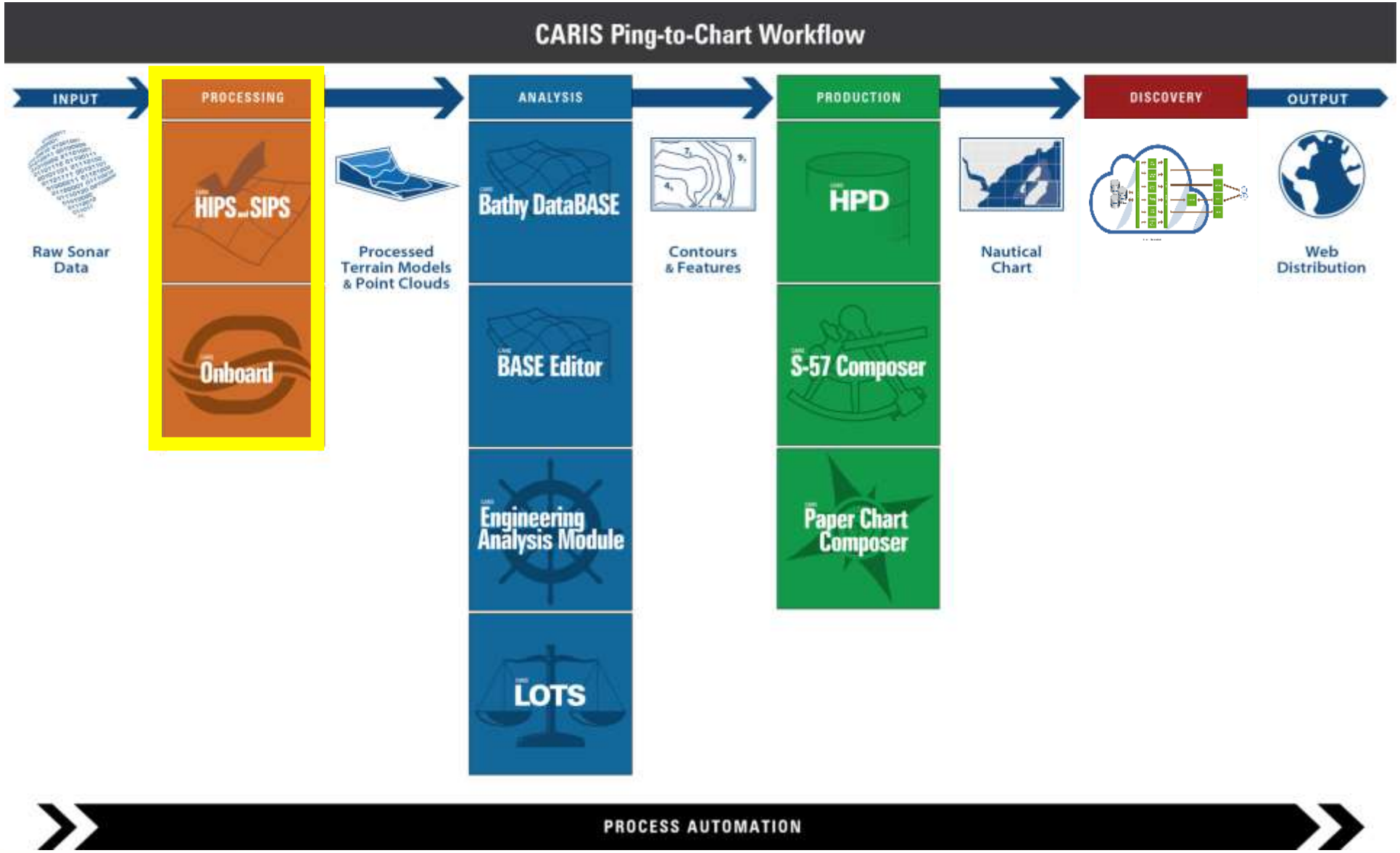
16th SAIHC Conference - Cape Town, South Africa - 4 September 2019 - Charles de Jongh

Teledyne CARIS – An introduction

- **CARIS is a provider of marine GIS solutions specially designed to meet the requirements of maritime agencies**
  - Developing geospatial software for 40 years (since 1979), since 2016 as part of the Teledyne Imaging group.
  - CARIS solutions support activities related to safety of life, the economy, defense, the environment, resource management and many other aspects
  - Continuously using international standards and participation in industry working groups, to ensure interoperability and maximum use of data.

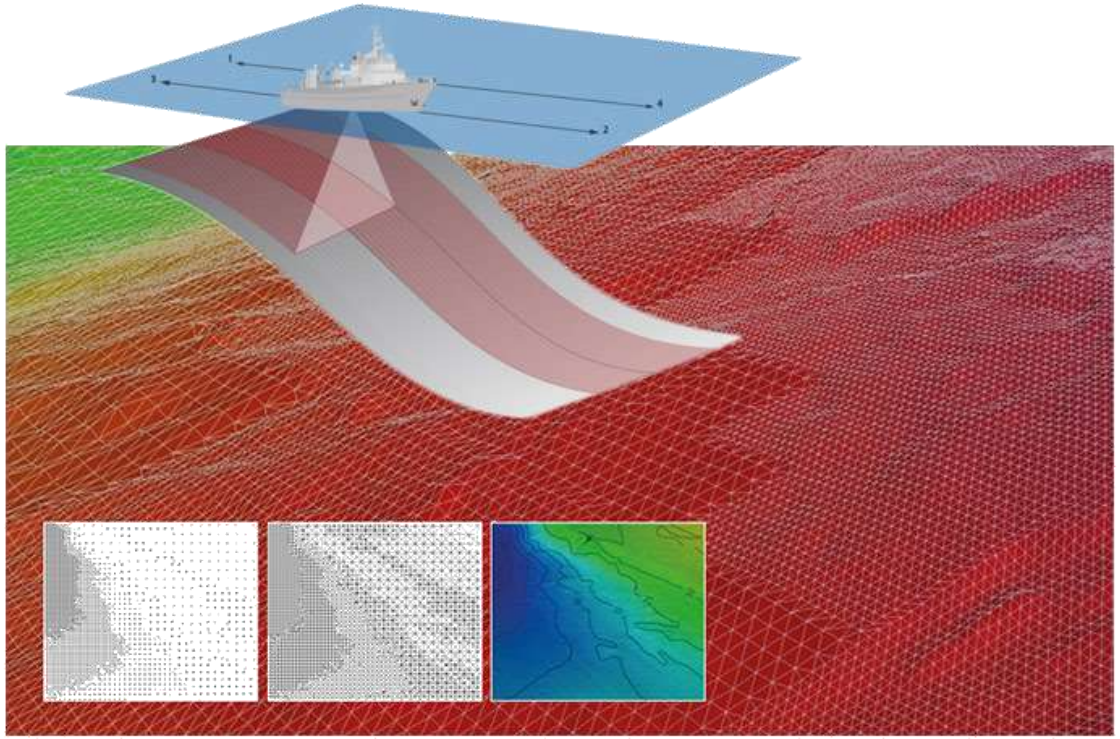
Worldwide use of Teledyne CARIS Solutions

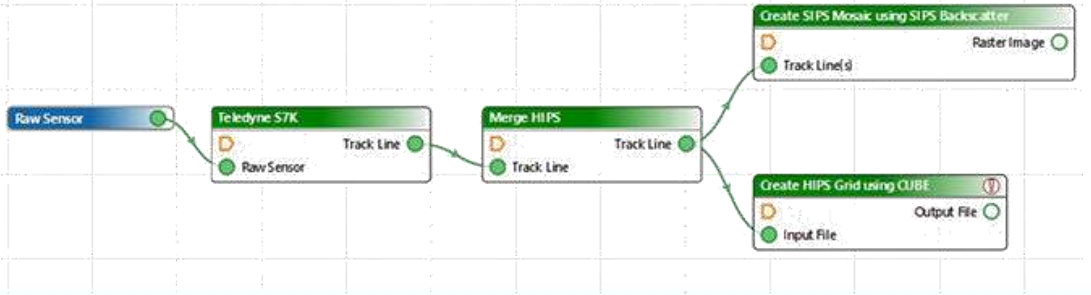
- More than 85 coastal nations
- Over 20,000 licenses around the world used by:
  - National and military mapping agencies
  - Commercial survey
  - Ports & waterways
  - Geology/geoscience
  - Research and academic institutions.
- Used by 92% of the world's hydrographic authorities


CARIS Ping-to-Chart Workflow
INPUT
PROCESSING
ANALYSIS
PRODUCTION
DISCOVERY
OUTPUT
Raw Sonar Data
HIPS and SIPS
Onboard
Processed Terrain Models & Point Clouds
Bathy DataBASE
BASE Editor
Engineering Analysis Module
LOTS
Contours & Features
HPD
S-57 Composer
Paper Chart Composer
Nautical Chart
Web Distribution
PROCESS AUTOMATION

Data Processing - CARIS HIPS AND SIPS

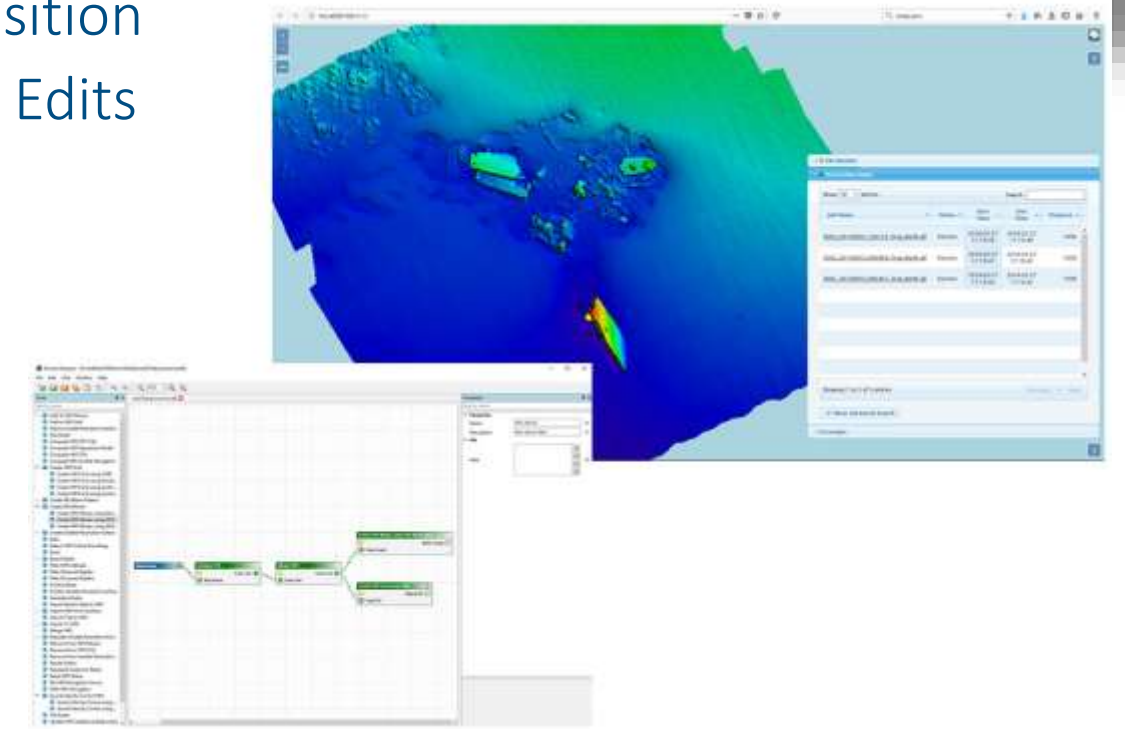
- Combined processing of Multibeam, Single Beam, Side Scan & Lidar datasets
- Bathymetric processing against IHO Standards
- Extensive sensor support
- Ease of use
- Extensive tool box
- Advanced automation capabilities
- A user community of thousands





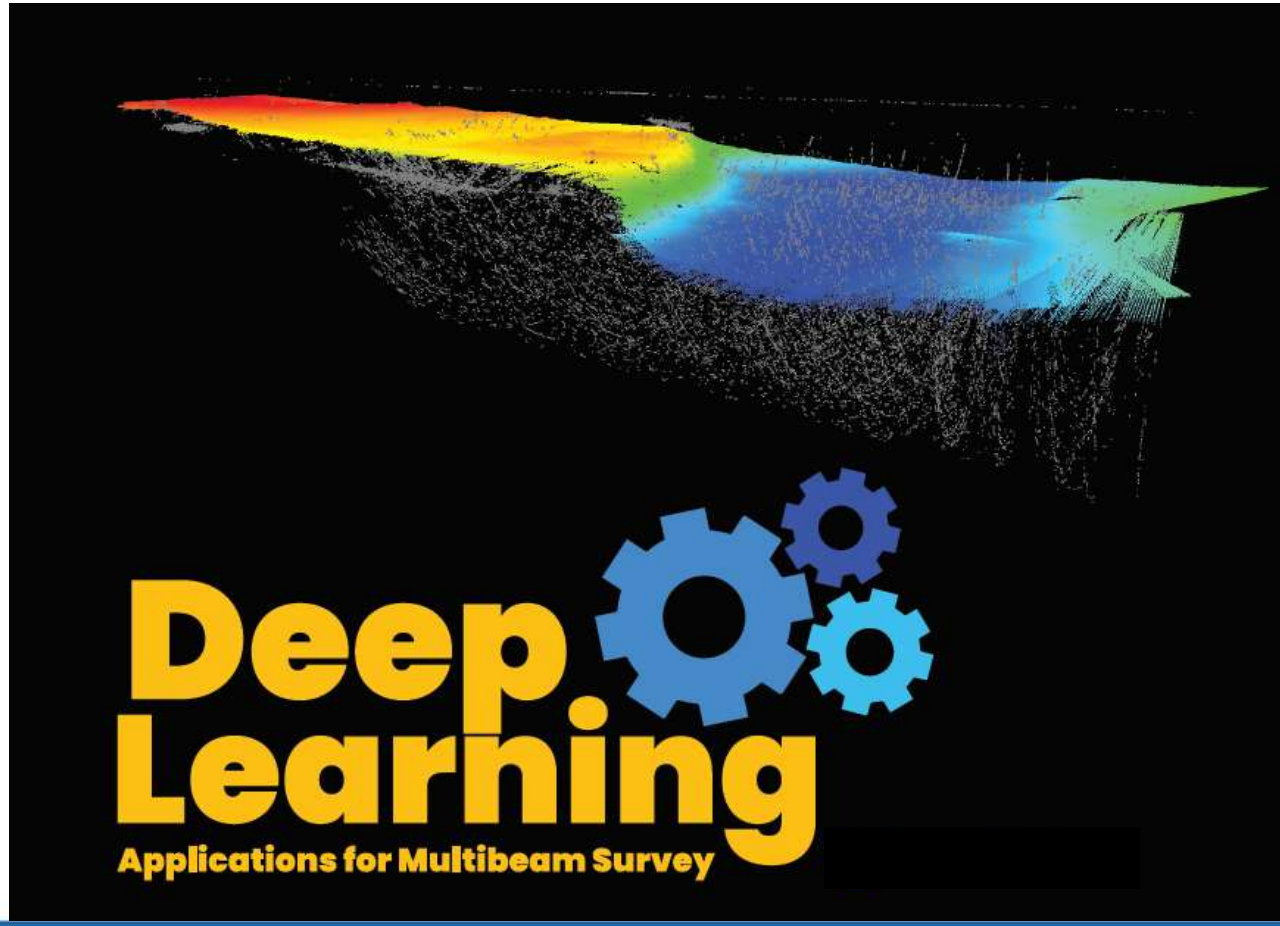
Automated Processing - CARIS Onboard

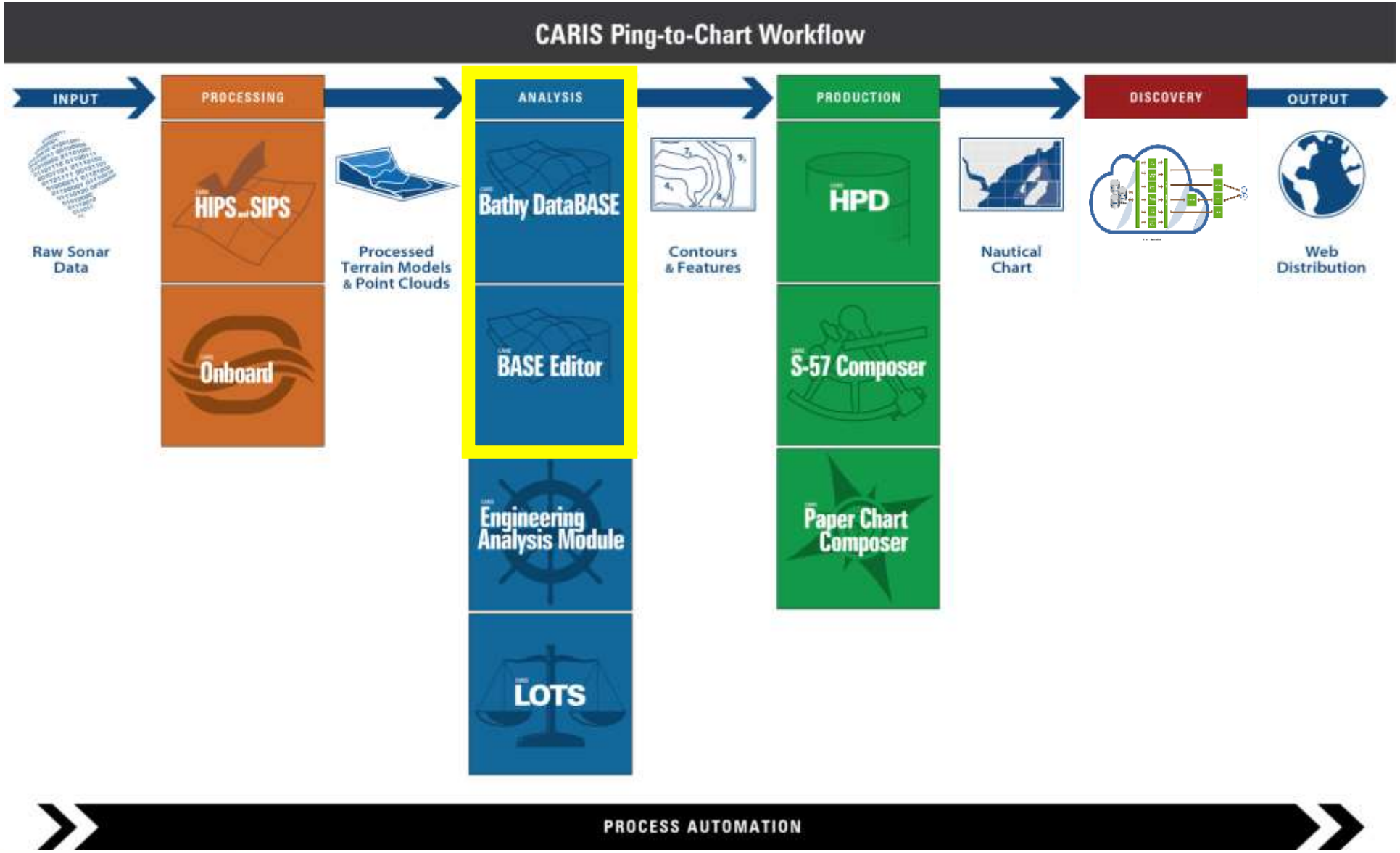
- Automated data processing solution for AUVs, ASVs, survey launches, etc.
- Processing in parallel with acquisition
- Focus on collecting quality data the first time
- Processed data and products available during acquisition
- User interaction begins at Quality Control and Final Edits
- Quick product turn around



New: Deep Learning Sonar Noise Classifier add-on to HIPS and SIPS

- Apply Deep Learning techniques to recognize patterns in survey data and automatically locate, classify, and remove noise without operator intervention.
- Processing done in the cloud (anonymously)
- Data is flagged as accepted or rejected.
- Beta testers very positive, can save a lot of time.
- Currently in Beta, expected to be released in Q4 2019.
- Also other ongoing projects to apply Deep Learning algorithms.

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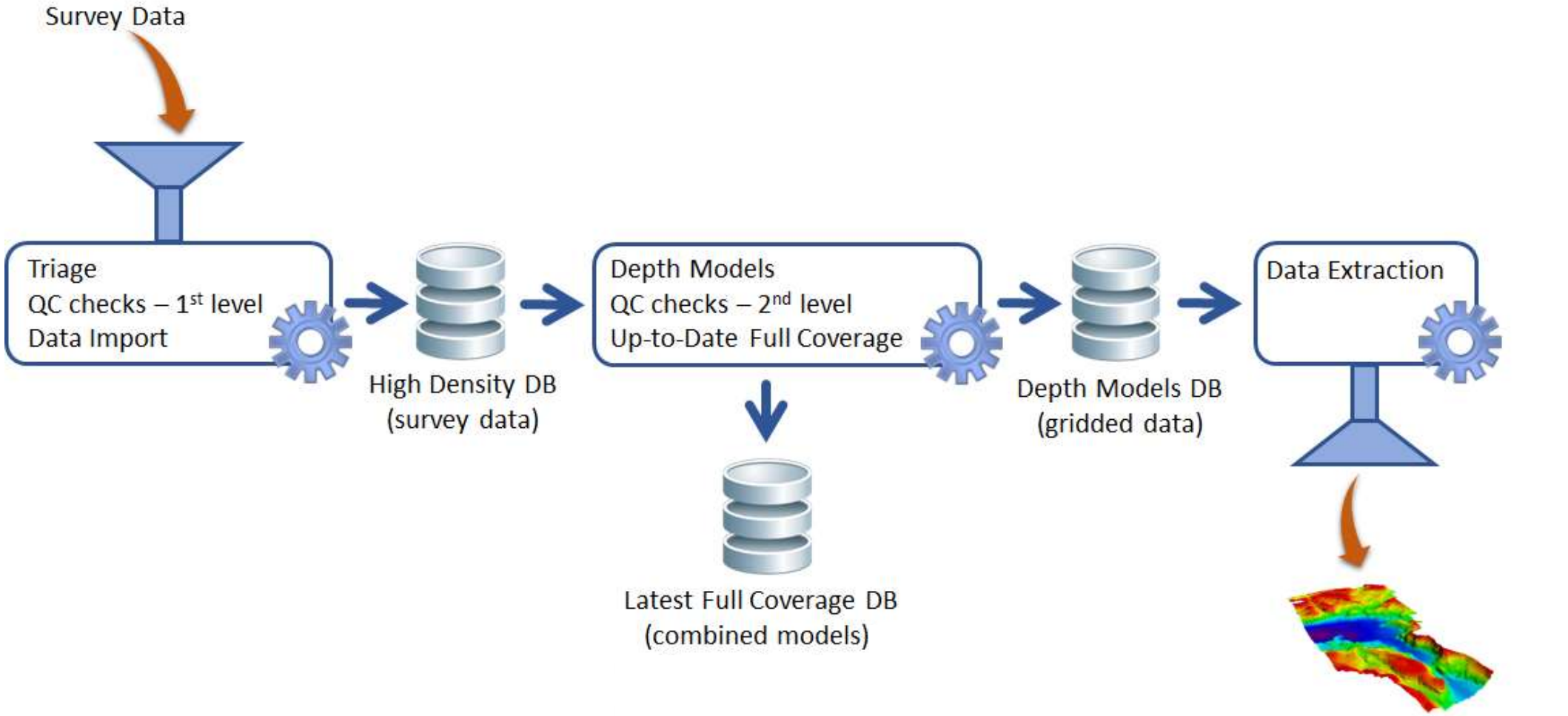
Analysis – CARIS BASE Editor & Bathy DataBASE

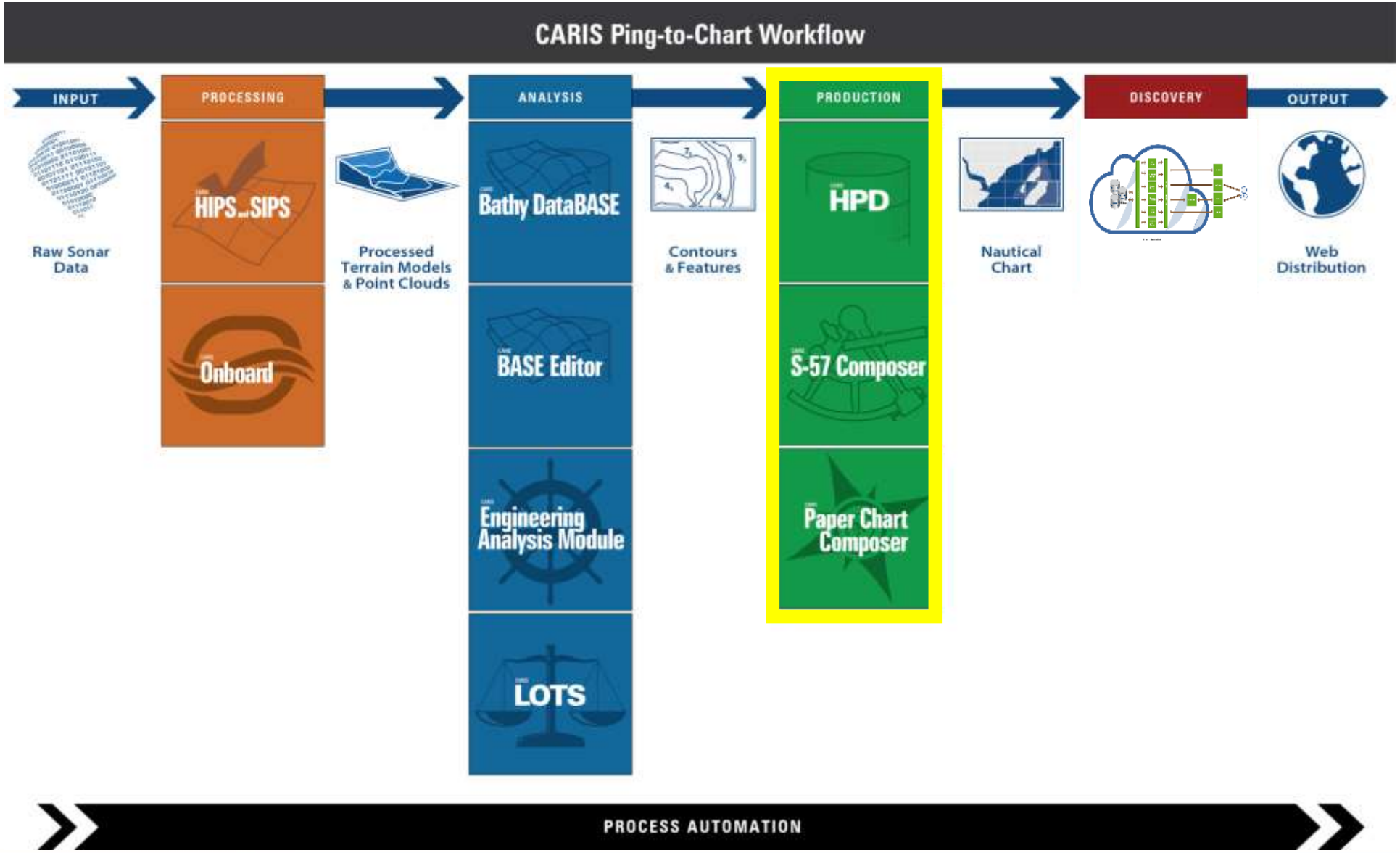
- Advanced Compilation and Analysis
  - Support for numerous elevation data formats
  - 2D/3D Visualization for DEMs and Point Clouds
  - Perform analysis and computations
  - Seamlessly model land and sea

- Easily Derive Vector Representations
  - High precision contours, depth area polygons and sounding sets
  - Meet a wide range of charting requirements: Paper Chart, ENC, IENC, AML, bath ENC, etc.

- Efficient Elevation Data Management with Bathy DataBASE
  - Manage all elevation assets together
  - Capture and store critical metadata
  - Enhances data security, integrity and usability

Automated workflows in CARIS Bathy DataBASE

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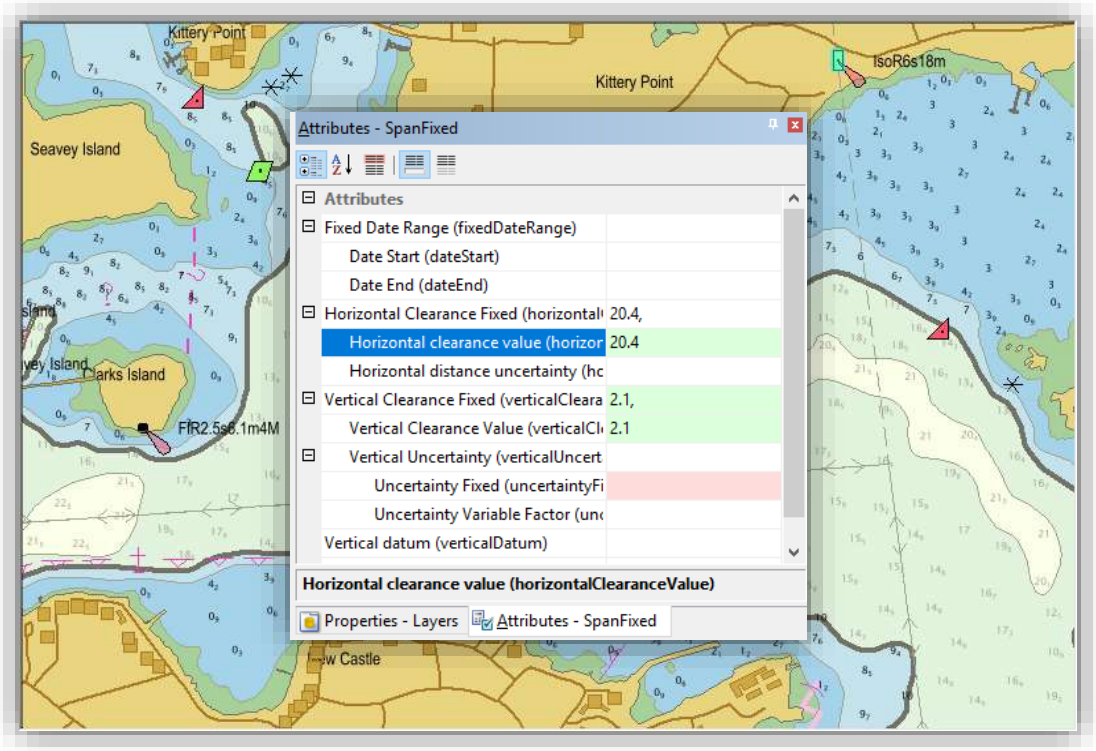
Production: CARIS Paper Chart Composer, S-57 Composer & CARIS HPD

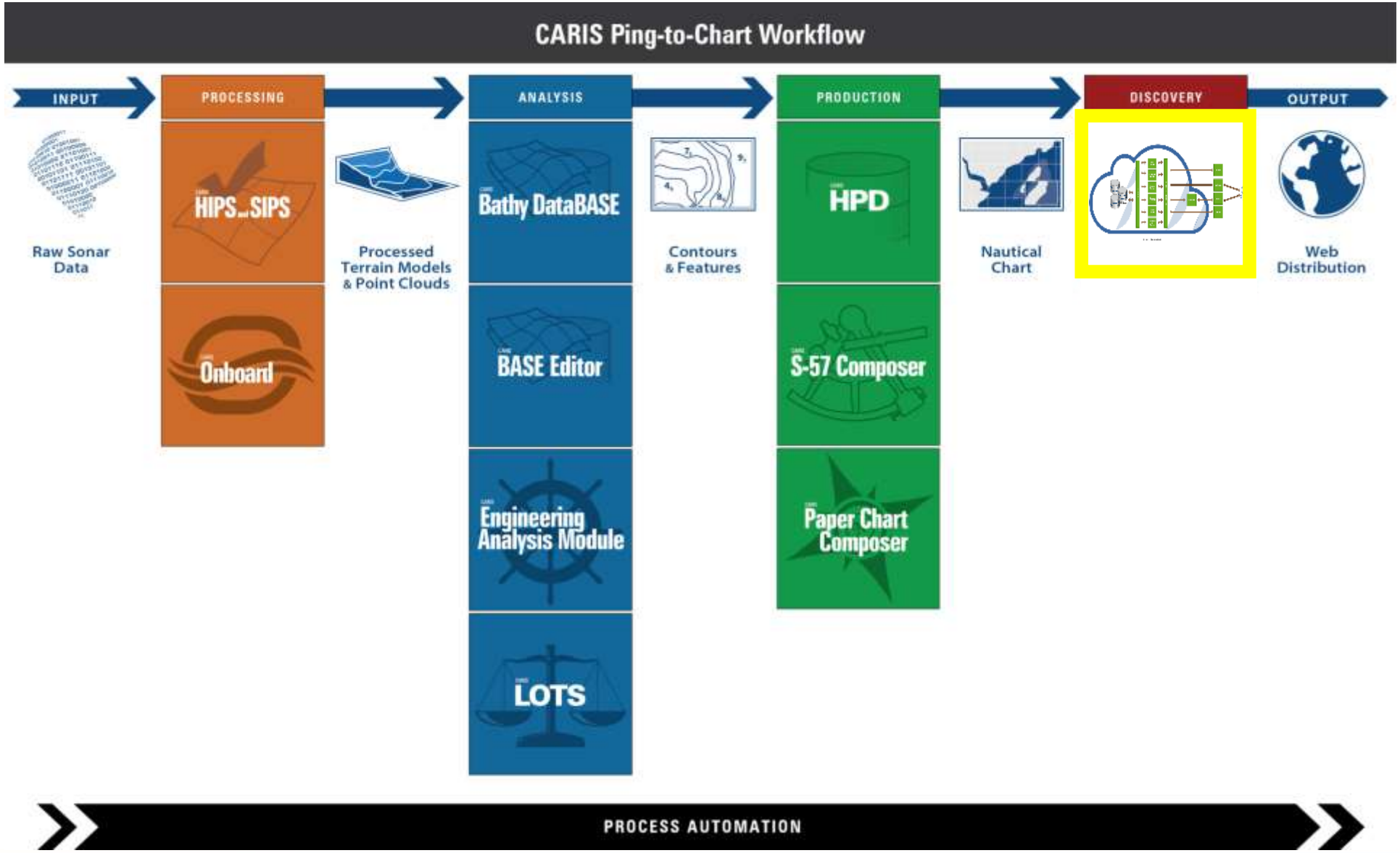
- Standalone or enterprise Paper & Electronic Charts Production
- Create, Optimize and Validate Multiple Electronic/Paper Chart Products
- Integrate Many GIS data sources
- Comprehensive quality control - IHO S-58 and user definable checks

- Features stored and updated only once in HPD database solution
- Derive multiple paper and electronic chart products from the seamless source
- Workflow driven production & Full object history.
- Secure user login to control data access and tasks performed
- Used by most Hydrographic Offices in the world.

New: Support for IHO S-100 standard

- S-100 module for S-57 Composer and HPD
- S-101 ENC Product Creation & Exchange Sets
- HPD S-100 Databases
- S-57 to S-101 Conversion and vice versa
- Will soon release support for S-121 (maritime limits & boundaries) & S-102 version 2 (bathymetric services) in BASE Editor.

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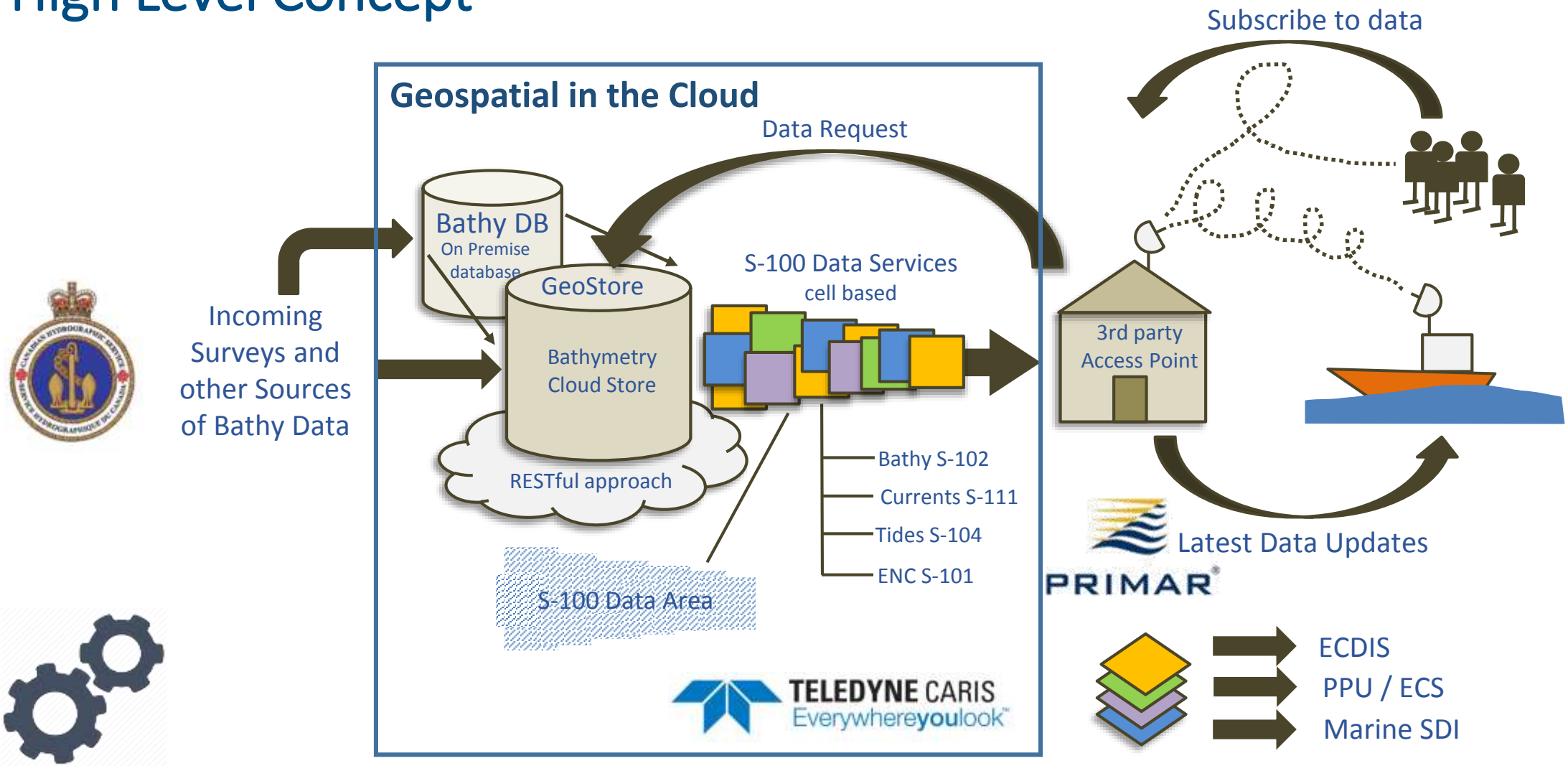
New: Working on Cloud Solutions - S-100 Data as a Service

- A pilot project has been conducted with the Canadian Hydrographic Service to implement an innovative bathymetry data service that will demonstrate the value of the evolving IHO S-100 data standards, initially focusing on the **S-102 bathymetric surface product specification**.

- The Project Team is made up of CHS (HO), Teledyne CARIS (geospatial software) and PRIMAR (ENC distributor)

- It will focus on the latest technological approaches to leverage some key opportunities for tomorrows hydrographic industry. Some advantages are quick survey turn around time and data integrity and security.

High Level Concept



Summary

- Teledyne CARIS develops trusted maritime GIS software solutions for hydrographic agencies as well as other users, with a global user base.
- Products range from tools for processing survey data to the creation and distribution of nautical products.
- Teledyne CARIS continually invests in research and development to keep up with the marine market requirements and provide new solutions based on latest (IHO) standards as well as technical advances.

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