Seamless transition from ENCs S-57 to ENCs S-101

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Introduction
S-100 Overview

International Hydrographic Organization (IHO)

S-100

Universal Hydrographic Data Model
Aims to support a greater range of hydrographic related digital data sources, products and customers.

A framework for development of the next generation products.

Not a product specification.
IHO Geospatial Information Registry

Registers:
- Feature Concept Dictionary
- Portrayal
- Metadata
- Data Producer Codes
- Product Specifications

New! The registry has been updated to conform to edition 1.1.0 of IHO Publication S-99 (Operational Procedures for the Organization and Management of the S-100 Geospatial Information Registry). The major change is the removal of the concept of Main and
S-100 Product Specifications

S-100 is intended for multiple product specifications
S-100 Product Specifications

Each product specifications is created/maintained by a domain group

IHO group

Non-IHO group
S-100 Product Specifications

IHO provides tools to maintain the information

- Intended to build feature catalogues (registered in the Feature Concept Dictionary Register)
- Intended to build portrayal catalogues (registered in the Portrayal Register)
S-100 product specifications

**IHO: S-101 to S-199**
- IHO S-101 ENC
- IHO S-102 Bathymetric Surface
- IHO S-103 Sub-surface Navigation
- IHO S-111 Surface currents
- IHO S-112 Dynamic Water Level Data
- IHO S-121 Maritime limits and boundaries
- IHO S-122 Marine Protected Areas
- IHO S-123 Radio Services
- IHO S-124 Navigational warnings
- IHO S-125 Navigational services
- IHO S-126 Physical Environment
- IHO S-127 Traffic Management
- IHO S-128 Catalogues of Nautical Products
- IHO S-1xx Marine Services
- IHO S-1xx Digital Mariner Routeing Guide
- IHO S-1xx Harbour Infrastructure
- IHO S-1xx (Social/Political)

**S-102 ed. 1.0 (Published 2012)**
- IALA S-201 Aids to Navigation Information
- IALA S-210 Inter-VTS Exchange Format
- IALA S-230 Application Specific Messages
- IALA S-240 DGNSS Station Almanac
- IALA S-245 eLoran ASF Data
- IALA S-246 eLoran Station Almanac

**Work on ed. 2 is ongoing**

**Draft versions exists**

**IOC: S-301 to S-399**

**Various: S-401 to ...**
- IEHG S-401 Inland ENC
- JCOMM S-411 Ice Information
- JCOMM S-412 Weather Overlay
S-100 Based Products Roadmap

C = Council
A = Assembly
SR = Stakeholder Review
MS = IHO Member State

Source: 9th HSSC Meeting, 2017
Migration from ENC S-57 to ENC S-101
S-101 Production

Convert S-57 features to S-101 features

IHO S-101 is currently having draft status (February 2017)
Automatic Conversion from S-57 to S-101

Conversion is useful for:
- (some) testing purposes
- faster migration of existing products/source

However will not fully utilize S-100/S-101 possibilities
- just one first step in S-100 production

CARIS tools includes both conversion and production capabilities
S-101 Migration from S-57 ENC in CARIS HPD

• Conversion of existing S-57 ENC into S-101 ENC is first migration step

• Additional steps needed
  • Populate new information for S-101 ENCs that cannot be converted from the S-57 ENCs
    • New features, attributes, metadata, scales of use, etc.

• Support for S-100 based products in HPD 4.0 in 2018
S-102 Bathymetric Surface Overview
S-102 Bathymetric Surface Product

Growing interest for enhanced navigation e.g. in
- High risk areas
- Environmentally sensitive areas
- High traffic areas

Includes raster bathymetric overlays
- S-102 Bathymetric Surfaces
- BAG surfaces
- Other/informal products
Purpose of S-102

• Need for high resolution bathymetric data
  • in the form of a bathymetric model

• Enables fusion of temporal data
  • E.g. tidal heights

• Overlay for S-101 ENCs
  • To compliment/enhance ENC information

• Potentially allows dynamic contouring
  • Maybe even in ECS and future ECDIS
Use Case

• CHS High Definition Bathymetry Trials
  • Permit the management of gridded bathymetric data in high definition
  • Test in collaboration with software manufactures, mariners and other users
  • 18 HD bathymetry cells
  • Level 1 (approx. 2m) and Level 2 (approx. 8m)
  • Files have a resolution of 1000 x 1000 pixels
  • Datasets available for tests and trials

S-100 resources
IHO S-100 Resources

IHO webpage with
• Introductory video about S-100 and S-101
• Power Point Presentation on S-100
• Download link to latest S-100 edition
• List of product specifications
• Master plan
• Etc.

http://www.iho.int/iho_pubs/standard/S-100_Index.htm
CARIS Resources

Experienced CARIS staff

• Actively participating in the IHO development
• Assisting organizations on S-100 product development
• Have released multiple S-100 supporting applications
• Provides workshops and training on S-100 to the Member States

S-100 utilized in CARIS software for years
Teledyne CARIS E-Learning

S-100 Online workshop

• S-100 standard overview
• S-101 Electronic Navigational Chart (ENC) Product Specification
• Examples of creating and processing S-100 products
• no software is required in order to participate
Summary

• S-102 product services being established
• S-101 products expected in 2019
• The transition from ENC S-57 to S-101 should be seamless
• Many other S-100 products are being developed
• CARIS software has S-100 capabilities
• Different resources available for the Hydrographic Offices to learn more and practice with the new S-100 standard and the new product specifications.