Our journey into S-100

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Meso American & Caribbean Sea Hydrographic Commission
10 November 2021
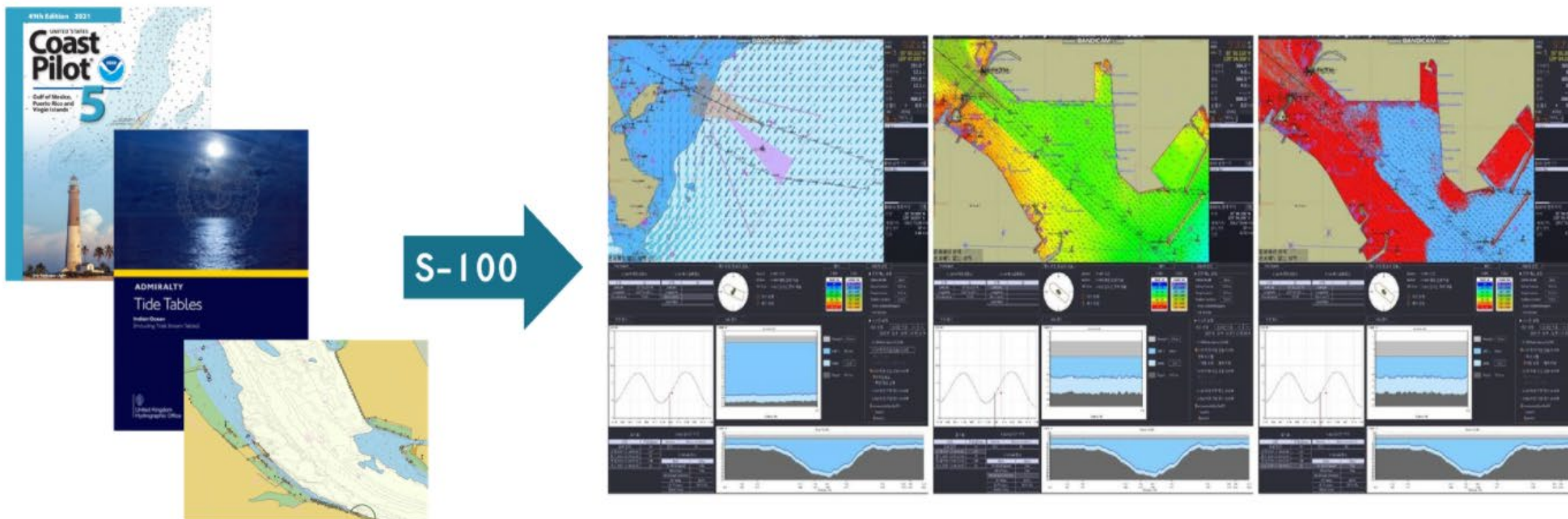
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› Evolving our Customer facing S-100 Data Service

› Our S-100 Lessons Learned

› S-100 Resources and Further Information

From S-100 to Future of Navigation

Digitalisation

Data contained in nautical charts and publications has the potential to be used more widely, beyond traditional navigation

S-100 A New Generation of Data Standards

IHO S-100 seabed to surface

S-101 Electronic Navigational Chart (ENC)
Specifies the content, structure, data encoding and metadata required for compiling S-101 ENC data.

S-123 Marine Radio Services
Indicating the location, availability, type of radio communications, frequencies and content of radio services for navigational information and other maritime radio communications.

S-201 Aids to Navigation Information (AtoNs)
Provides a common structure for the exchange of information about AtoNs. This includes buoys, beacons, racons, lights, sound signals and AIS.

S-122 Marine Protected Areas (MPAs)
Intended to encode MPA information for use in ECDIS and other information systems.

S-102 Bathymetric Surface
A digital elevation model which represents the seafloor in a regular grid structure. It can be used alone or as an important element/source for future S-100 conformant ECDIS navigation.

S-121 Maritime Limits and Boundaries
Digital maritime boundary information; including maritime limits, zones and boundaries.

S-127 Marine Traffic Management
Product specification for vessel traffic services, pilotage, routing measures, and ship reporting systems.

S-104 Water Level Information
For the capture and data transfer of tidal and water level data for use in an ECDIS or any proposed dynamic tide application.

S-111 Surface Currents
The horizontal movement of water represented by both speed and direction.

S-129 Under Keel Clearance Management
Encodes information about a vessel's under keel clearance for use in managing the safe passage through shallow waters.

First generation S-100 ECDIS

› Support for S-100 and S-57

› Interoperable with other S-100 product specifications

› Intelligent ECDIS query function

› Dynamic ENC content allows for streaming real-time tidal information

› Expanded discovery metadata

› No manual software upgrades to modify chart content

› No new type approval for introduction of new data products

S-100 ECDIS
PLUG & PLAY

FEATURE CAT.

PORTRAYAL CAT.
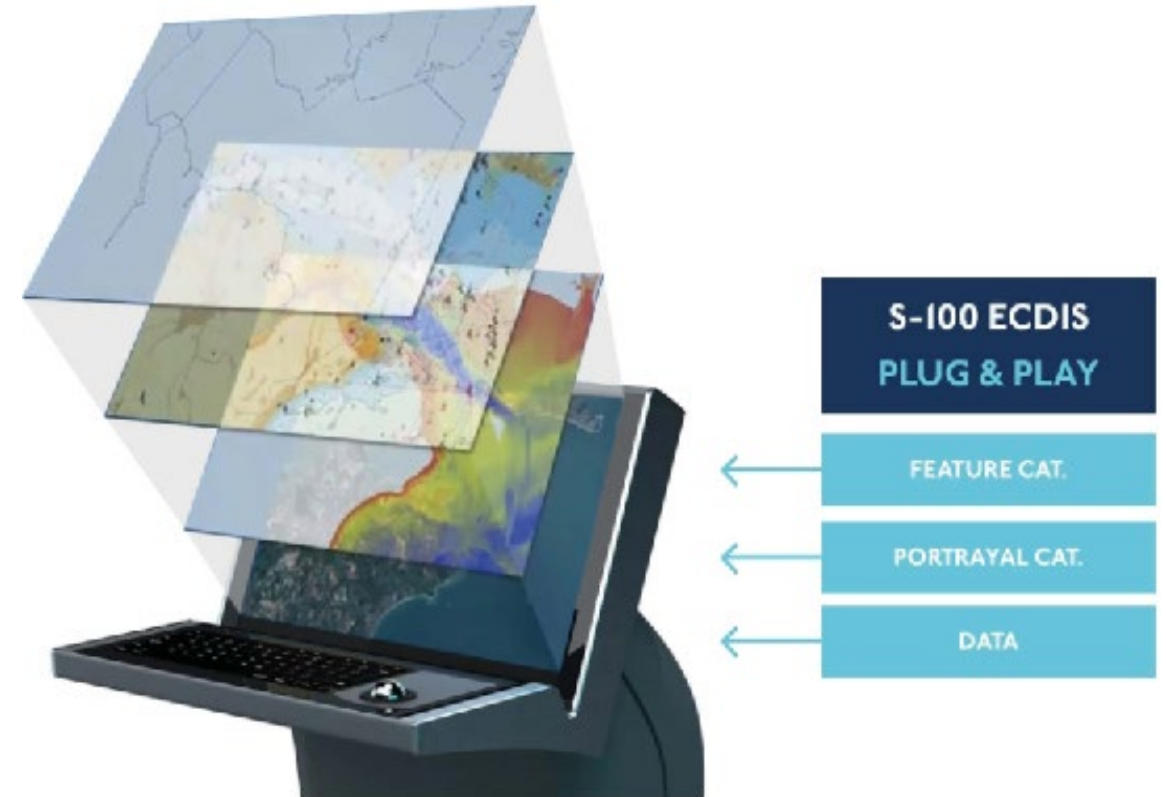
DATA

Standards, maturity and predicted implementation
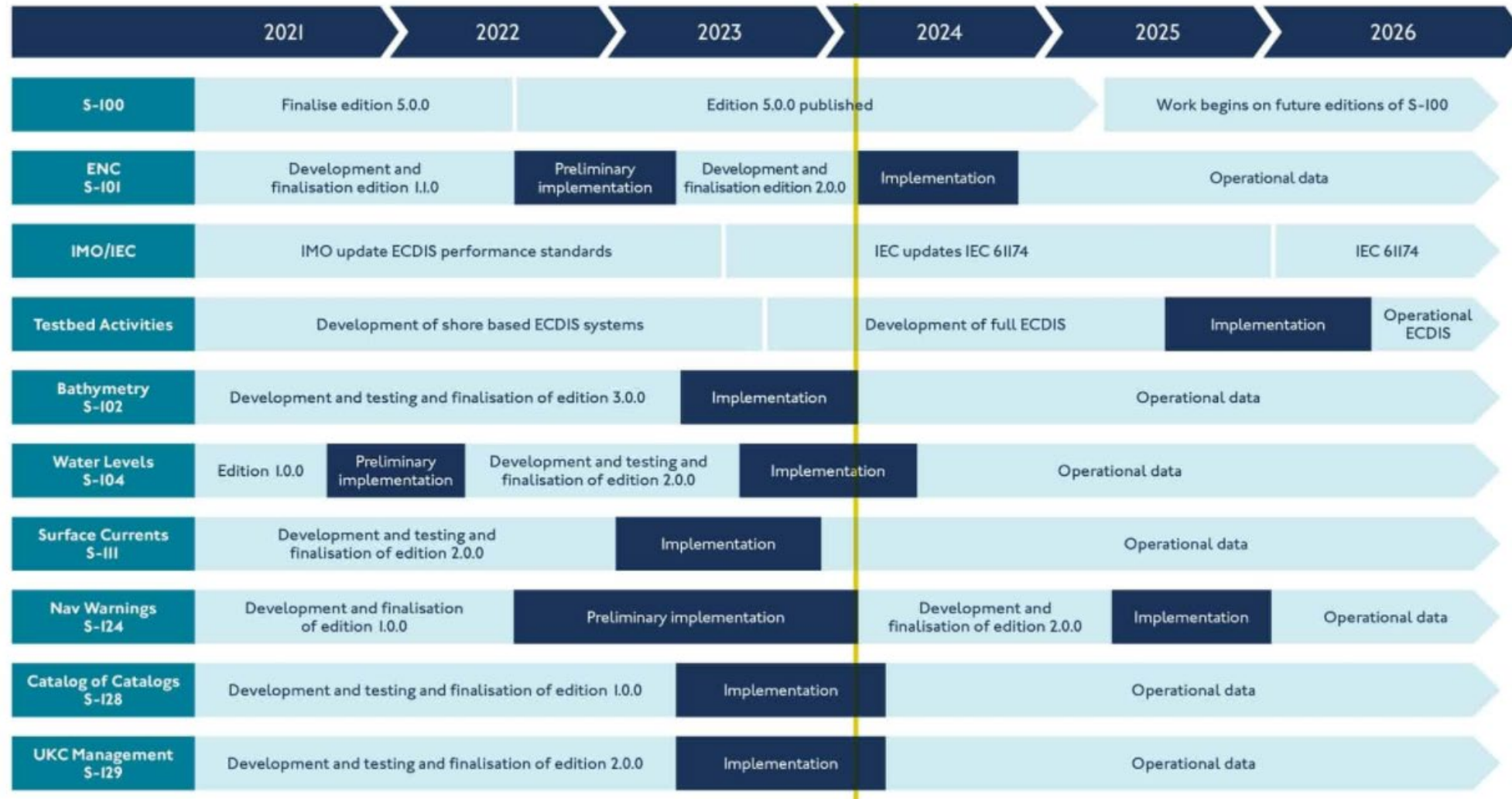
UKHO S-100 Data Set User Research

› We've been conducting a wide range of **user research** into the desirability of S-100 product specification data sets with:

  › Mariners

  › Fleet Superintendents

  › Our global Distributor network

  › Original Equipment Manufacturers

  › GIS development organisations

› We're prioritising our focus based on this, and the maturity of the S-100 product specifications, and have the following insight we'd like to share:
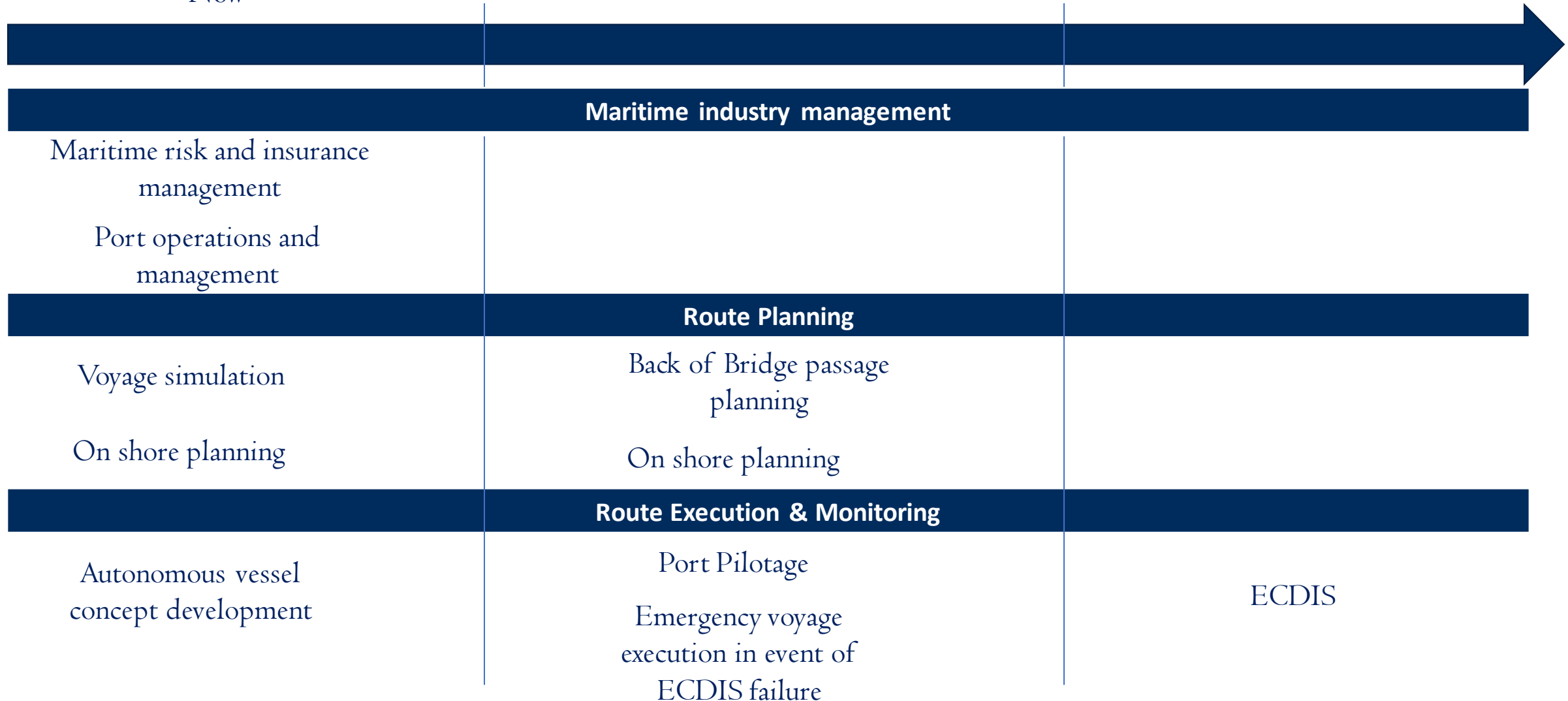
UKHO User Insight on the route to market for S-100 Data Sets

| Now	Next	Later

Maritime industry management		
Maritime risk and insurance management		
Port operations and management		

Route Planning		
Voyage simulation	Back of Bridge passage planning	
On shore planning	On shore planning	

Route Execution & Monitoring		
Autonomous vessel concept development	Port Pilotage	ECDIS
	Emergency voyage execution in event of ECDIS failure	

UKHO S-100 Roadmap

› **S-101 - Electronic Navigational Chart (ENC)**

› **S-102 - Bathymetric Surface**

› **S-104 - Water Level Information for Surface Navigation**

› **S-111 - Surface Currents**

› S-121 - Maritime Limits and Boundaries

› S-122 - Marine Protected Areas

› S-123 - Radio Services

› S-124 - Navigational Warnings

› S-127 - Traffic Management

› S-128 - Catalogue
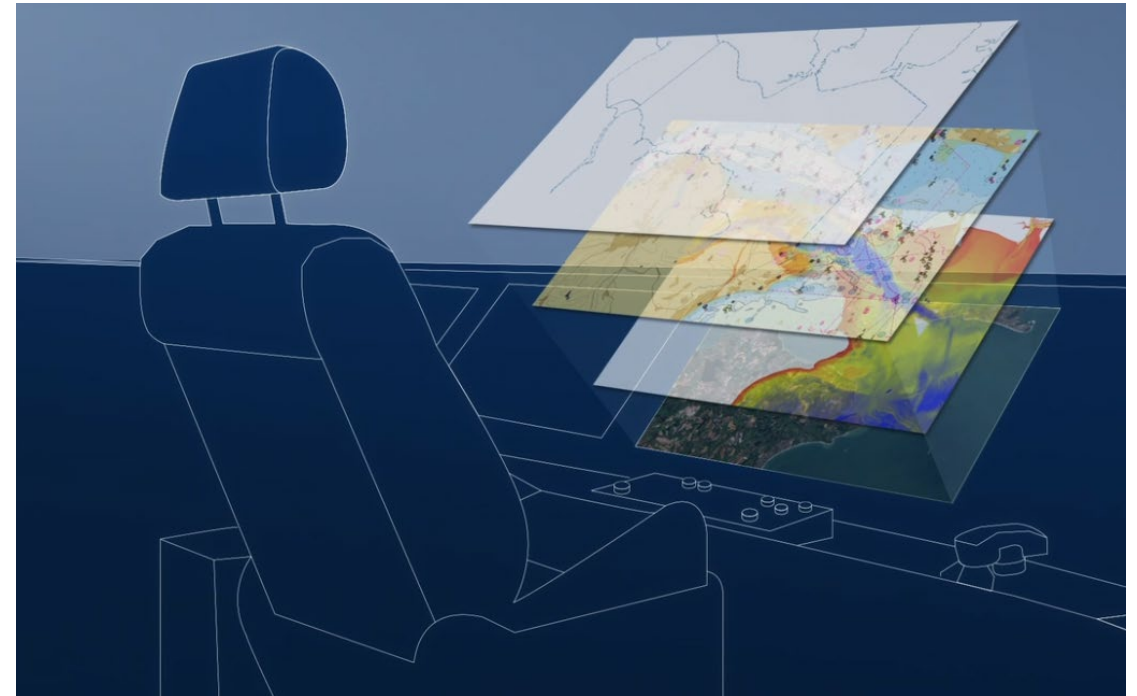
UKHO S-100 Strategy, Themes and Goals

Standards development

› Development of Standards and Regulations through the IHO Working Groups

Collaboration

› Collaboration across Commercial and Defence through OEMs and ECDIS manufacturers

UKHO capability

› Flexible workforce through SMEs and skilled workforce
› Flexible infrastructure through production systems

Evolving our Customer facing S-100 Data Service

UKHO S-100 Data Service Update

› Our overall approach to the development of our new service is to follow the Build, Measure and Learn process.

› **Build-Measure-Learn** (BML) is a process of building a product, measuring user metrics and learning from them to better respond to customer needs and improve the product.

› We are doing this by:

  › **learning** about the S-100 data sets with user research

  › **building** an initial test data set and then making it available for testing and feedback with users

  › **measuring** progress and capturing our learning so we can build this into our approach
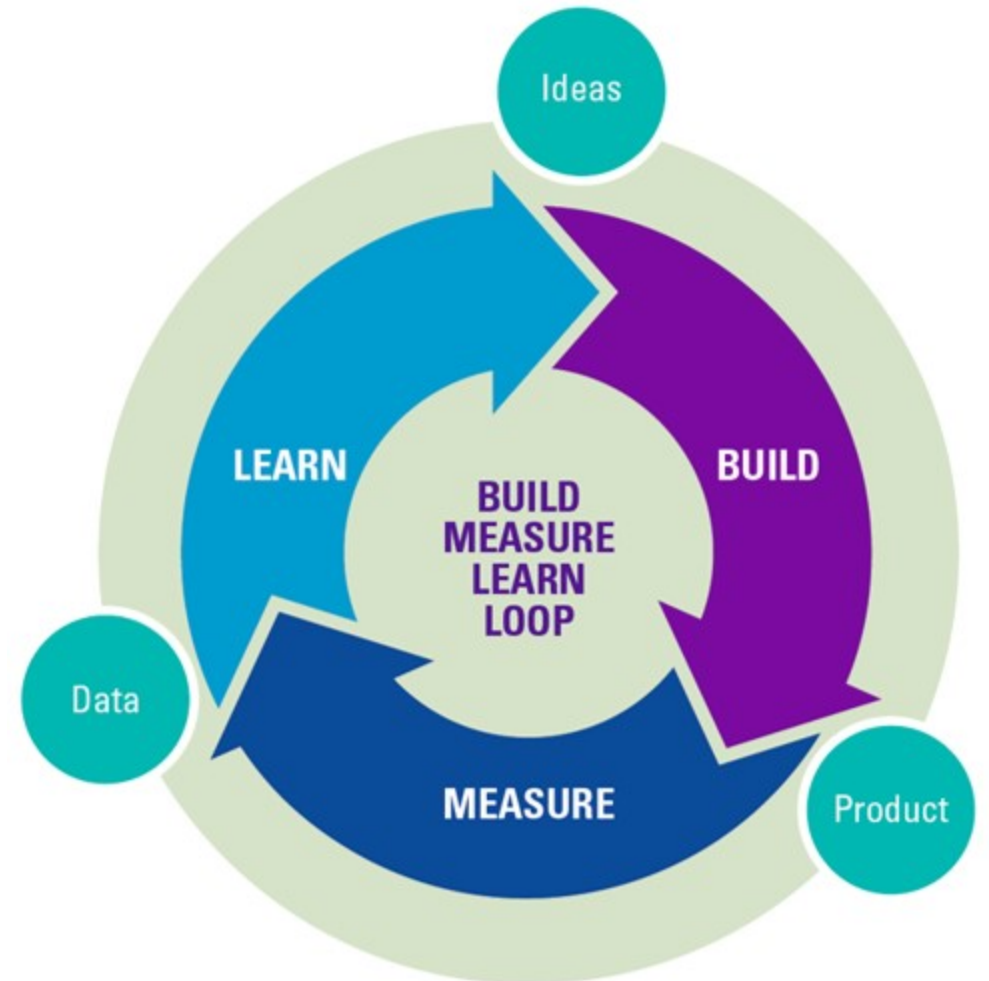
UKHO S-100 Data Service Update

› We are building and releasing S-100 Trial Datasets and making them available, free of charge, with a **Data Exploration Licence** for research and development purposes via our **ADMIRALTY Marine Data Portal**

› The purpose of our S-100 Trial Data Sets is to:

  › Provide our industry partners with a range of data sets which can be trialled in **preparation** for the future

  › **Test** our ability to create data sets

  › Identify potential for our **future services**

  › Identify the **gaps** in the standards and capabilities

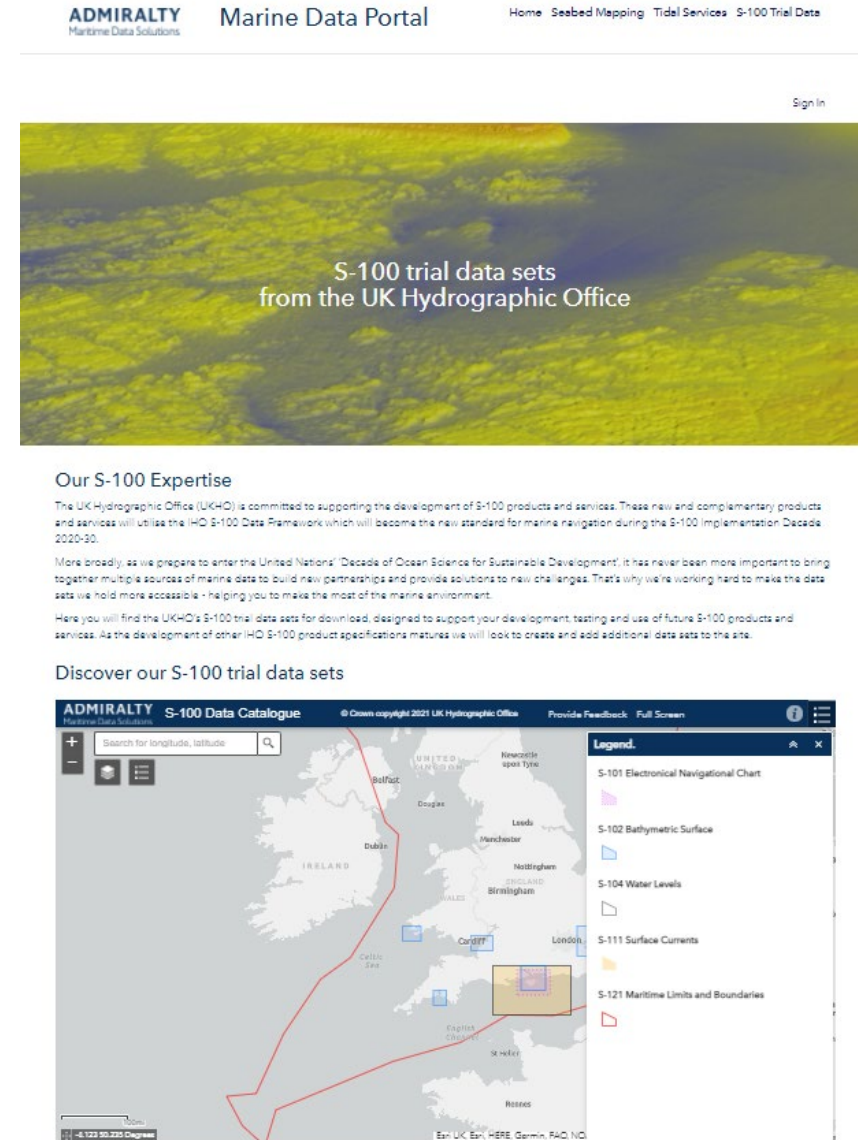 › Grow our S-100 Data Service capability **maturity**

UKHO S-100 Data Service Update

› We now have **five** Trial Data Sets available in our S-100 Data Service which are:

- S-101 Electronic Navigational Charts

- S-102 Bathymetric Surface

- S-104 Water Levels

- S-111 Surface Currents

- S-121 Maritime Limits and Boundaries

› We released S-101 and S-102 Trial Data Sets in January, S-104 and S-111 in April and S-121 in October
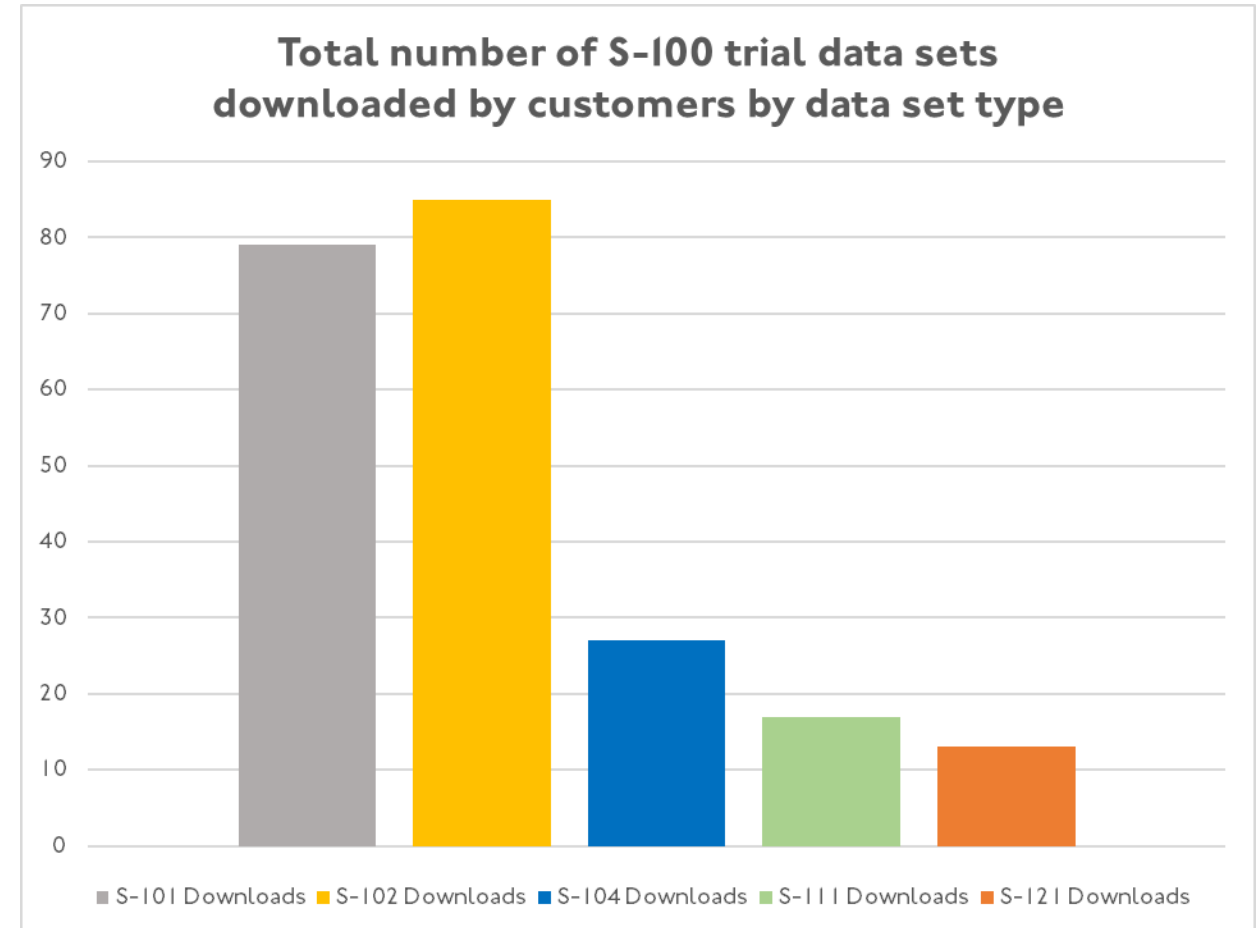
› As we are now growing our range of data sets we introduced an **S-100 Data Catalogue** into our service in September to make it easier for users to find, select and download the data sets they want

UKHO S-100 Data Service Update

› We are gathering **insight** and usage figures of our S-100 Trial Data Sets via Google Analytics

› This has found:

  › **57%** of all visitors to the S-100 pages of the ADMIRALTY Marine Data Portal go on to complete a **download** of a trial data set. This is our **User Conversion Rate**

  › A total of **227** of our trial S-100 data sets have been downloaded so far

  › The **most popular** is **S-102** Bathymetric Surface followed by **S-101** Electronic Navigational Charts

Total number of S-100 trial data sets downloaded by customers by data set type

Legend: ■ S-101 Downloads ■ S-102 Downloads ■ S-104 Downloads ■ S-111 Downloads ■ S-121 Downloads

The image above shows one of our S-100 Data Service customer usage dashboards, which we are using to monitor the desirability of our S-100 Trial Data Sets and test new user features

UKHO S-100 Training Course Development

› In response to requests we've **created a package of training** to support our Hydrographic Office community colleagues wanting to learn about S-100

› Our first module is an **S-100 Introductory online course**

› We **began delivering** S-100 Introductory online courses, at various dates and times, in October to ENC producer nations who are members of IC-ENC and have more dates scheduled in November and December

› **Full details** of dates, times, and how to book are in the Annex at the end of this presentation

› Completion of the S-100 online Introduction course will lead into the development of the **Established** and **Advanced** follow-on courses.

› All training content is developed by UKHO subject matter experts (SMEs).

Our UKHO S-100 Lessons Learned

UKHO S-100 Data Service Development Lessons Learned

#1 Start with User Needs

We're producing trial data sets, and S-100 training, in line with customer feedback and market insight to ensure we're focussing on the right thing

#2 Collaboration and Learning is Key

We're working together across lots of different teams at UKHO, and in partnership with industry and our Hydrographic Office community colleagues, to focus on building knowledge and expertise and sharing our learning

The image above shows our Core Values at UKHO, which underpins the way we work and is reflected in our approach to our S-100 Data Service development

UKHO S-100 Data Service Development Lessons Learned

#3 Expect the Unexpected

The S-100 data set standards are still maturing, as are the enabling production tools and supporting standards (e.g. S-100 Part 15 Data Protection Scheme) and it's still early days

#4 Think Big, Act Small

We have researched our priorities based on user need and are focussing on developing S-100 data sets in line with this strategy while also ensuring we are continuing to support our existing customers, products and services. We have spent time researching and putting Data Governance, Data Asset Management, and Service Management best practice frameworks in place so we can begin to test and mature them too

The image above shows our Core Values at UKHO, which underpins the way we work and is reflected in our approach to our S-100 Data Service development

Thank you

UKHO S-100 Resources and Background Information

UKHO S-100 Resources and Background Information

› S-100 Data Catalogue and Trial Data Sets where you can search, view and download our S-100 trial data sets on the **ADMIRALTY Marine Data Portal** and access supporting information about the data, and Open Source software held in the International Hydrographic Office Organization's S-100 Geospatial Information Registry website

› S-100 Data Catalogue now available | News | ADMIRALTY news article on the **ADMIRALTY Maritime Data Solutions Website** which provides information on the catalogue and why we've created it
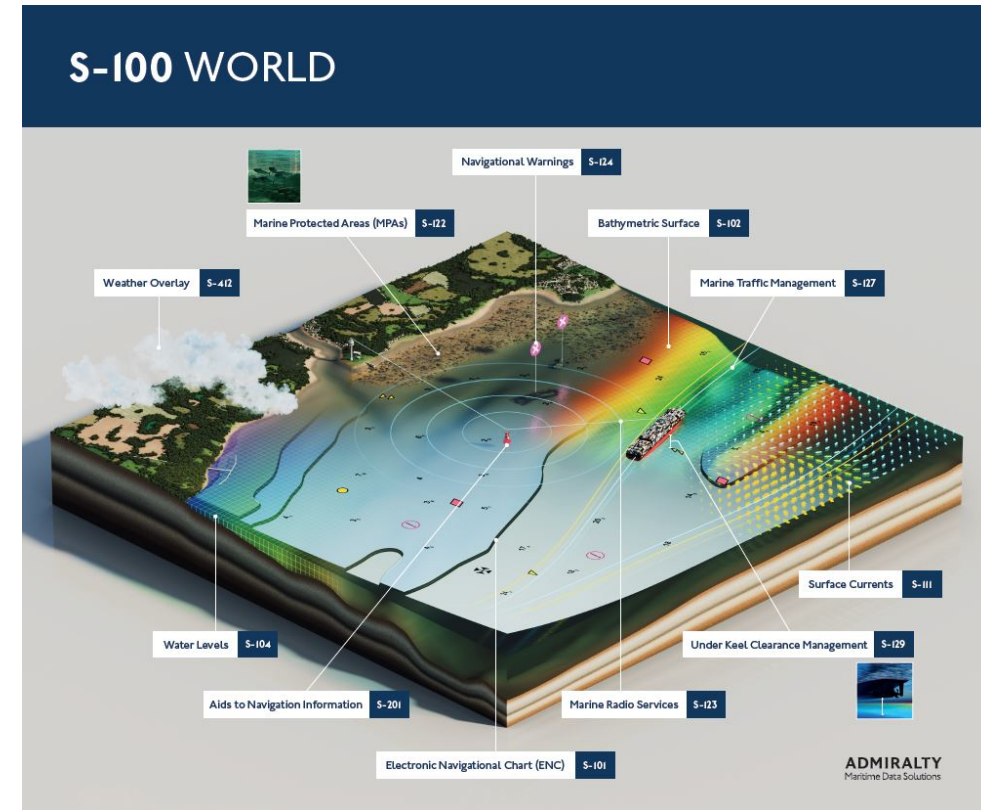
UKHO S-100 Resources and Background Information

› S-100 Supporting standards of the future | ADMIRALTY content on the **Discover ADMIRALTY Website** which provides an overview of the S-100 work we're doing. This is part of a package of content which relates to the innovation we're leading on to support transformation across the maritime industry and prepare for the future Innovation | ADMIRALTY

› S-100 A New Generation of Data Standards video on the **ADMIRALTY TV You Tube** Channel which brings to life the opportunity S-100 data can bring
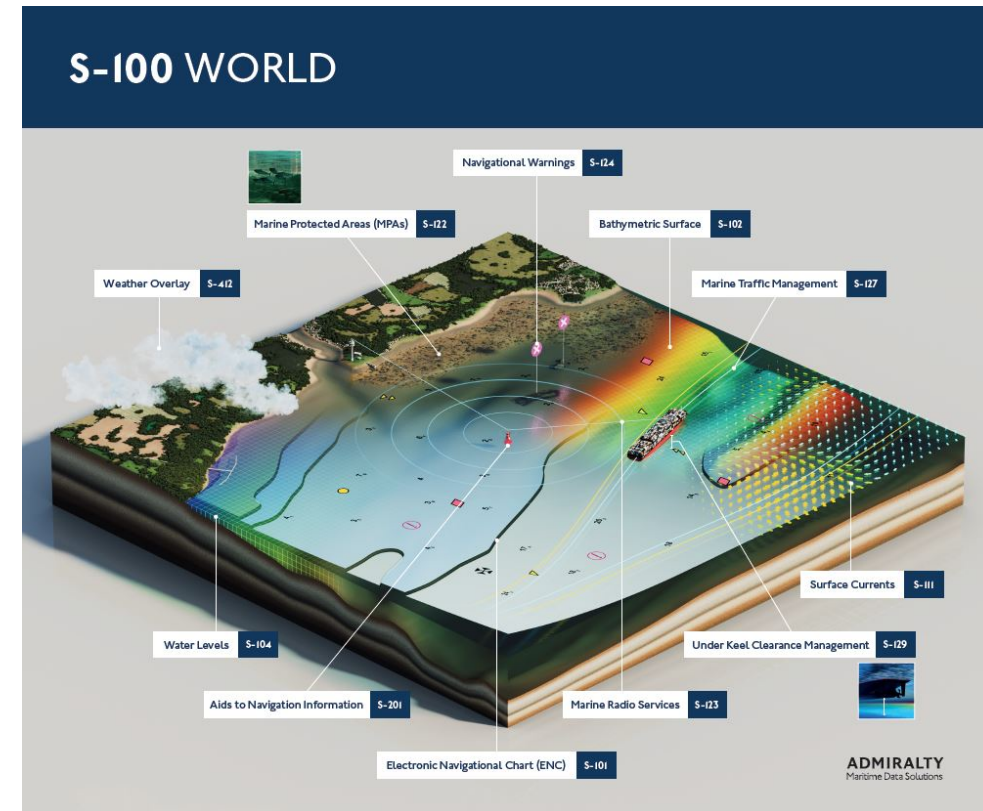
UKHO S-100 Resources and Background Information

UKHO S-100 Training course details:

Introduction to S-100
(2x Half days – Online)

This half day online course is for delegates who wish to start to explore the foundations of understanding S-100. This is the ideal starting point at which to develop your knowledge and understand your next progression point to future courses in this topic.

The online course will be delivered via Microsoft Teams, using PowerPoint presentations to share information. Live demonstrations and group discussions will also be used to develop your subject knowledge.

Subjects taught:

Part 1
> The Development of S-100
> S-57 Limitations
> What is S-100
> S-100 Advantages
> The Decade of Implementation
> S-100 UHDM Overview
> S-100 Parts
> Geospatial Information Registry
> S-100 Product Specifications
> S-98 Interoperability
> S-100 Sea Trials
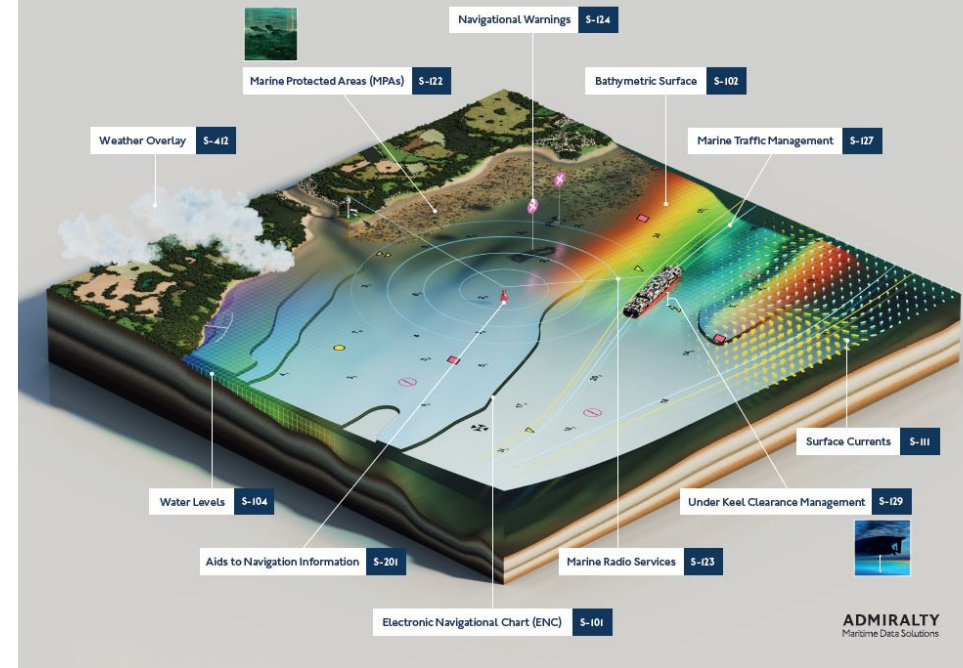> S-100 Support
> Working Groups
> Test Bed
> Catalogue Builder

Part 2
> Dataset Discovery Metadata
> Display Scale Range
> Data Coverage
> Data Classification and Encoding
> Guide (DCEG)
> Skin of the Earth
> Feature Relationships
> Information Types
> Feature Attributes
> Feature Geometry
> Data Quality S-58
> Meta Data
> Data Delivery
> Data Delivery
> Dataset Loading – ECDIS
> S-57 to S-101 Comparison
> S-57 to S-101 Conversion

Accredited by:

UK Hydrographic Office

S-100 WORLD

Navigational Warnings S-124
Marine Protected Areas (MPAs) S-122
Bathymetric Surface S-102
Weather Overlay S-412
Marine Traffic Management S-127
Surface Currents S-111
Water Levels S-104
Under Keel Clearance Management S-129
Aids to Navigation Information S-201
Marine Radio Services S-123
Electronic Navigational Chart (ENC) S-101

ADMIRALTY
Maritime Data Solutions

For more information and to make a booking please contact internationaltraining@ukho.gov.uk

UKHO S-100 Resources and Background Information

UKHO S-100 Training course details:

| Description	Date	Time Zone
Course Advertised*	10th Sept 21	
Internal Test	21st Sept 21	
Live Course (A)	05th Oct 21 07th Oct 21	UTC +1
Live Course (B)	12th Oct 21 14th Oct 21	UTC +1
Live Course (C)	26th Oct 21 27th Oct 21	UTC +9
Live Course (D)	09th Nov 21 10th Nov 21	UTC +4.5
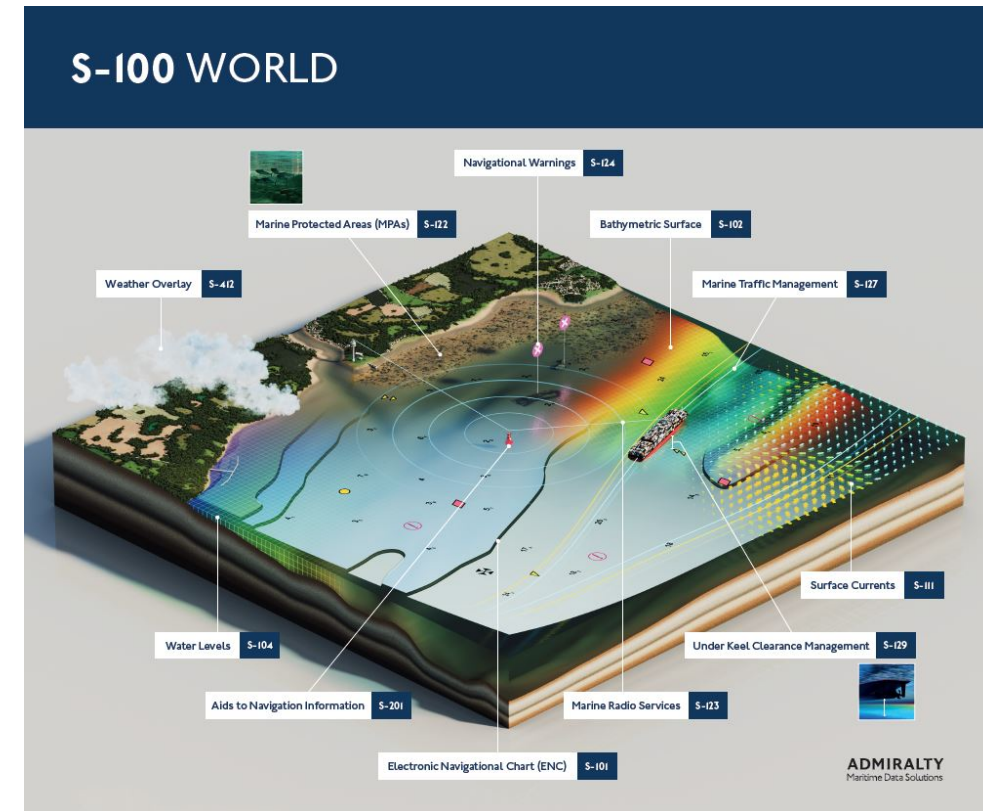
*Advertised to all IC-ENC members in the first instance

UKHO S-100 Resources and Background Information

UKHO S-100 Training course details:

Description	Date	Time Zone
Live Course (E)	16th Nov 21 17th Nov 21	UTC +8
Live Course (F)	23rd Nov 21 24th Nov 21	UTC +8
Live Course	30th Nov 21 01st Dec 21	UTC +12
Live Course	07th Dec 21 08th Dec 21	UTC +12
Live Course	14th Dec 21 16th Dec 21	UTC
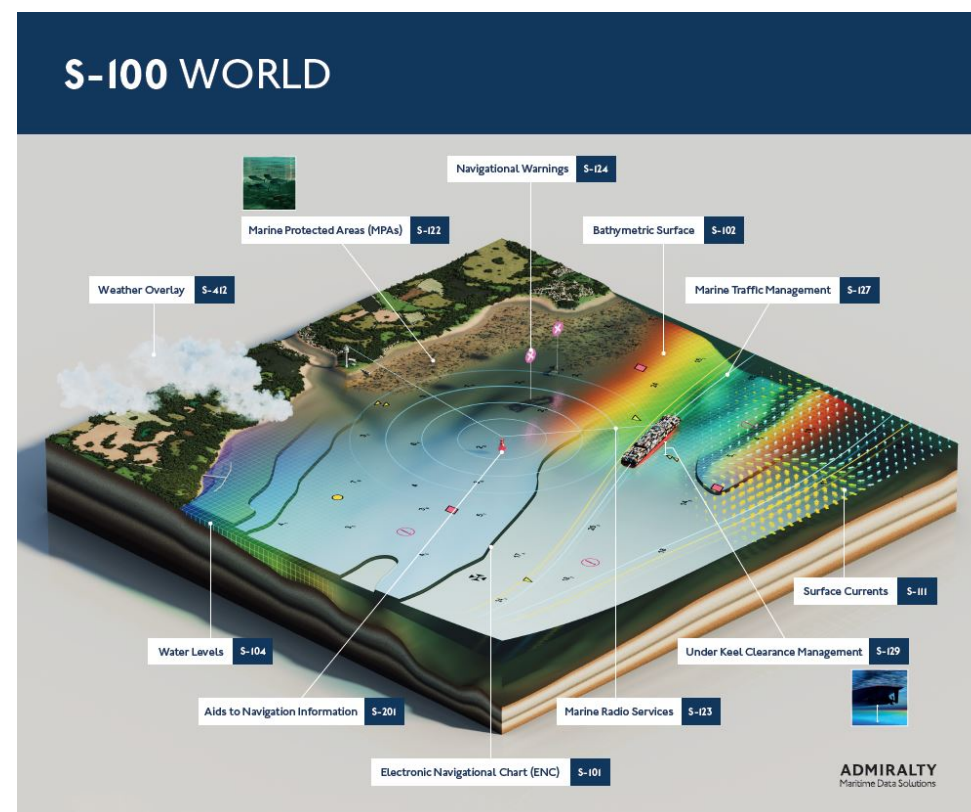
For more information and booking please contact internationaltraining@ukho.gov.uk

2022 – 2023 dates to be released depending on demand