

Reducing Contentious Issues of Baselines and Maritime Limits through the Use of an International Data Standards for the Submission of Law of the Sea Data

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Outline

Introduction

Sources Of Uncertainties leading to Contentious Issues

Data Standards

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Introduction

- Relevant UNCLOS Articles:
 - 16 – Charts and Lists of Geographic Coordinates (Part II)
 - 47 (47.8 & 47.9) – Archipelagic Baselines
 - 75 – Charts and Lists of Geographic Coordinates (Part V)
 - 84– Charts and Lists of Geographic Coordinates (Part VI)



Sources of Uncertainties

- Nautical Charts
 - Paper charts
 - Infrequent updates
 - Insufficient scales
 - Different vendors
 - Contentious datums
- List of Coordinates
 - Discrepancies between different datums
 - No geodetic datum at all



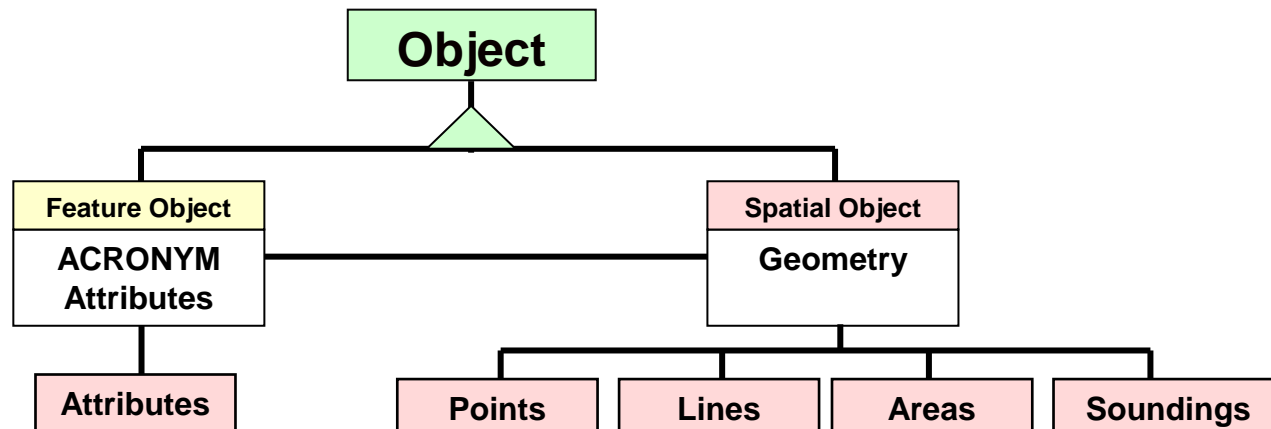
Data Standards – Status & Benefits

- S-57
 - In use, development frozen
 - World wide recognition
 - ABLOS recommendation for ENC consideration as nautical chart
 - Intended for extension beyond ENCs, but hardly done
- S-100
 - Published January 2010
 - IHO Registry Extensions already planned as well



S-57 Data Model

- Object oriented
- Stores real world entities as “objects” having a
 - “Feature object” component: descriptive information
 - “Spatial object” component: positional information



- Allows relationships between objects (master/slave, collection, associaton)



Limitations of S-57

- Limited object and attribute set for LOS
- Available geometries for LOS not ideal



Law of the Sea objects in S-57

- Line
 - STSLNE: Straight Territorial Sea Baseline
- Area
 - ADMARE: Administration Area
 - TESARE: Territorial Sea Area
 - CONZNE: Contiguous Zone (TS to 24 M)
 - EXEZNE: Exclusive Economic Zone (TS to 200 M)
 - FSHZNE: Fishery Zone
 - COSARE: Continental Shelf Area (TS to Outer Limit of the Continental Shelf)



S-57 limitations due to Geometries

- Maritime Limits and Boundaries (MLB) are generated
 - with geodetic tools
 - as line objects
 - Easier to maintain MLBs as line objects
- Require new MLB objects and attributes



Proposed Extensions and Modifications

- Modify some existing features and attributes
- New features and attributes
- Additional Geometries



Proposed catalogue extension for MLB objects

- Lines
 - Normal baselines
 - Straight baselines
 - Maritime Limits: 12M (Territorial Sea) 24 M (Contiguous Zone), 200 M (EEZ), Outer Limit of the Continental Shelf
 - Maritime Boundaries
 - Article 76 components: Formulae and Constraints



New proposed catalogue extension for MLB objects

- Points
 - Baseline points
 - Maritime Boundary points
 - Maritime Limits points
 - Foot of the slope markers
 - Sediment 1% markers
 - Outer continental shelf points
- Areas
 - Marine Areas such as JDAs, marine sanctuaries, environment protected areas, joint fishing zones, etc.



Proposed catalogue extension for law of the sea attributes

- New attributes to characterize legal and temporal aspects as well as link them to other functions of the database.
 - Categories of limits and boundaries
 - Data source
 - Legal source
 - Legal status
 - Date of change in legal status
 - National ownership or sharing of the limit or boundary
 - Source document, associated legal documents or reports
 - Nautical chart reference
 - Date of publication or entry into force
 - Dependence on other features in the database



Example 1: Reworked existing object

strbln

Straight baseline. Part of the territorial sea baseline model. Can be straight baseline, archipelagic, bay closing, river mouth closing, historic bay closing or delta or dynamic coastal environment straight baseline

- Type: Line
- Defining attribute: category of straight baseline

The Defining attribute will control the display appearance of the object.



Example 1: Newly proposed attribute for reworked existing object

catsbl

Category of straight baseline used in the territorial sea baseline model. Applies as defining attribute to the Straight Baseline object: **strbln**

1. Straight baseline
2. Archipelagic baseline
3. Bay closing line
4. Delta and unstable area baseline
5. Historic bay closing line
6. River mouth closing line

Type: Enumeration



Example 2: Newly proposed attribute

catbas

Category of territorial sea baseline

1. normal baseline
2. straight baseline

Type: Enumeration

If the category of baseline is 2. straight baseline, then conditionally the attribute **catsbl** must also be populated with the type of straight baseline.



Example 2: Newly proposed object

basept

Territorial sea baseline model point.

- Type: Point
- Defining attribute: category of baseline
- Will also have attributes to retain the original published values of the coordinates: **coorla** and **coorlo**
- A base point can be uniquely named and identified. Straight baseline points are almost always named and identified.

Example new object & attribute

S57catalog

S-57 Law of the Sea Object Catalogue

Version 0.1

Browse by [Object Acronym:](#)

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#)

Browse by [Attribute Acronym:](#)

[A](#) [C](#) [E](#) [F](#) [H](#) [I](#) [L](#) [M](#) [N](#) [O](#) [P](#) [R](#) [S](#) [T](#) [U](#)

Object Acronyms
[\(Disclaimer\)](#)

[sedmrk](#)
[sedpro](#)
[srvbat](#)
[srvsei](#)
[strbln](#)

Please inform us of any item that requires change

Object Class: Straight Territorial Sea Baseline

Acronym: strbln (L)

Code: N/A

Set Attribute_A: [HORDAT](#); [NATION](#); [NOBJNM](#); [OBJNAM](#);

Set Attribute_B: [INFORM](#); [NINFOM](#); [NTXTDS](#); [SCAMAX](#); [SCAMIN](#); [TXTDSC](#);

Set Attribute_C: [RECDAT](#); [RECIND](#); [SORDAT](#); [SORIND](#);

Set Attribute_GIS: [carkey](#); [feacod](#); [sourid](#); [usernb](#);

Set Attribute_LOS: [catsbl](#); [idchrt](#); [legsou](#); [legsta](#); [pbldat](#); [report](#);

Definition:

Straight baseline. Part of the territorial sea baseline model. Can be straight baseline, archipelagic, bay closing, river mouth closing, historic bay closing or delta or dynamic coastal environment straight baseline.

References:

Remarks:

Attribute: Category of Straight Baseline

Acronym: catsbl

Code: N/A

Attribute Type: E

Definition: Category of straight baseline used in the territorial sea baseline model.

Expected input:

ID	Name
1	Straight Baseline
2	Archipelagic Baseline
3	Bay Closing Line
4	Delta and Unstable Area Baseline
5	Historic Bay Closing Line
6	River Mouth Closing Line

Indication:

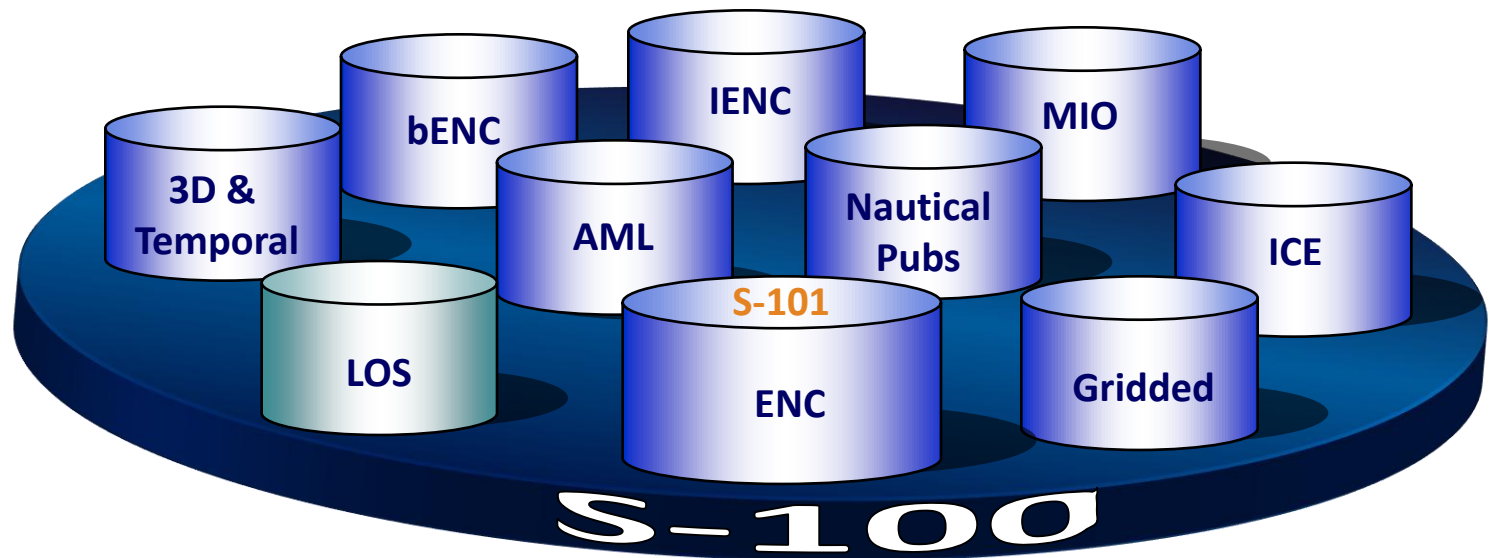
Format:

Remarks:

Done

What standard to extend

- S-57 > Frozen
- S-100!



Registries

- Operational Registry available (http://195.217.61.120/iho_registry/)



The screenshot shows the IHO Registry website. At the top left is the IHO logo, a gold anchor with a red and green cross. The main header reads "IHO - HYDROGRAPHIC REGISTRY" in large blue letters, with "Hydrographic related Feature Data Dictionaries" below it. A navigation bar contains buttons for Home, Account, Proposal, Registry Details, Administration, Search, Reports, and Help. On the left side, there is a "Data Dictionaries" section with a list of categories: HYDRO, ICE, OEF, IENC, and NPUB. Each category has links for Feature Index, Attribute Index, Enumeration Index, and Information Index. The main content area contains three paragraphs of text explaining the temporary nature of the page, the freedom of the feature dictionary registers, and the process for submitting organizations. At the bottom, it provides contact information for reporting problems.

IHO Registry

IHO - HYDROGRAPHIC REGISTRY

Hydrographic related Feature Data Dictionaries

Home Account Proposal Registry Details Administration Search Reports Help

Data Dictionaries

HYDRO
Feature Index
Attribute Index
Enumeration Index
Information Index

ICE
Feature Index
Attribute Index
Enumeration Index
Information Index

OEF
Feature Index
Attribute Index
Enumeration Index
Information Index

IENC
Feature Index
Attribute Index
Enumeration Index
Information Index

NPUB
Feature Index
Attribute Index
Enumeration Index
Information Index

This is a temporary page for the IHO Feature Dictionary registers. This will eventually be replaced with the home page of the IHO Registry to provide access to not only the feature dictionaries, but other registers e.g. meta, data types etc.

Unlike previous editions of S-57, the feature dictionary registers contained in this registry are free from any constraint. New proposals, if accepted, will be registered and available for immediate use in product specifications as required. Unacceptable proposals will also remain in the registers in order to prevent similar proposals being submitted in the future.

You are free to view the registry without registering, but if you wish to participate as a Submitting Organization and you have not previously registered then you can do so [here](#). If you have already registered and wish to apply for Submitting Organization permission to submit to other registers, an application form can be found [here](#)

Whilst this application has undergone exhaustive tests, any problems experienced or suggested additions/changes to the help page should be addressed to barrie.greenslade@ukho.gov.uk



Additional Benefits to S-100 extension

- Open – can be integrated by others
- Faster updating of official nautical charts (BSH, 2008) or other nautical products with up-to-date maritime limits and boundaries



Ongoing Work

- DOALOS tasked by IHO to produce S-100 extension
- DOALOS attending IHO HSSC Meetings in 2009
- CARIS prototype catalogues available to DOALOS



Technological Challenges

- Stand Alone applications in principle possible
- Database driven highly recommended
 - Benefit: seamless feature relationships and history tracking
 - Needs: Geodetic tools
 - Equidistant / Median Line
 - Envelope of Arcs from normal points & straight baselines
 - Wagon Wheel Filter
 - Legal Bay Closing Evaluation
 - Geodetic Line Intersection
 - Interactive baseline tool



Technological Challenges II

- MLB's lists: Joining points into lines
 - Loxodromes
 - Geodesics
 - Envelops of Arcs

- Points need nature of limit information



Conclusions

- Standards help to overcome contentious issues on coordinate publication
- S-100 seems the perfect basis
- Extensions are needed and should be discussed further by stakeholders

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