SCUFN27-07.1C

Paper for Consideration by SCUFN

Development of an S-100 Product Specification for Undersea Feature Names and Registering SCUFN terms in the IHO Registry

Submitted by:	IHB
Executive Summary:	This paper proposed that current SCUFN should consider extending the gazetteer of undersea names GIS database and document it as an S-10x product specification. It also proposes that the definitions of undersea features be included in the IHO registry.
Related Documents:	S-100 Standard
Related Projects:	GEBCO Technical Sub-Committee on Ocean Mapping (TSCOM) and Sub-Committee on Regional Undersea Mapping (SCRUM)

Introduction / Background

The GEBCO Sub Committee on Undersea Feature Names (SCUFN) has converted the content of the gazetteer of undersea feature names (UFN) from a spreadsheet format into a GIS database. This has been used to create an online web map service - available at http://www.ngdc.noaa.gov/gazetteer/. As part of this process, SCUFN formalised the feature type definitions that are described in the gazetteer and produced a dictionary containing definitions of these feature types (see http://www.kosbidb2.co.kr:8080/recommend/). Additionally, SCUFN included geometry objects that describe the spatial extent of the features contained in the GIS gazetteer database.

Analysis

The work undertaken by SCUFN is highly commendable, however it is proposed that the current model of the GIS gazetteer database should be improved in order to optimise its usefulness. The current model replicates the SCUFN gazetteer spreadsheet which has one single feature type (undersea feature) and a standard set of attribute types. These attributes include: *Specific Term, Generic Term, Associated Meeting, Proposer, Year of Proposal, Discoverer, Year of Discovery, Origin of Name, Additional Information, Primary Coordinates, Secondary Coordinates* in the gazetteer spreadsheet and: *name, type, meeting, proposer, proposer_y, discoverer, discovery_Y, history, comments* in the GIS database. This "one size fits all" approach is illustrated in the diagram below[1].

[1] *The current model actually defines the same feature model in terms of their geometry types (point, line string, polygon …) however for the purpose of this discussion this will be considered as a single UFN feature.*

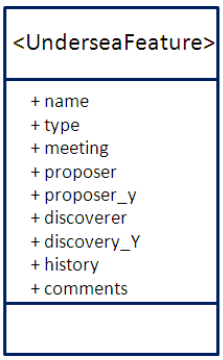

Figure 1

This current model does not make provision for describing the unique properties of the different undersea feature types such as Seamount, Fracture Zone, Canyon … (as identified in the SCUFN list of definitions). For example, the important characteristics of a *Seamount* might be its height and depth below the sea surface, whereas for a *Trough* they might be minimum and maximum depths. The current gazetteer includes some feature characteristics but only as random text in the "comments" field. For example the entry for the "Evlanov Seamount" includes a free text comment indicating "*Minimum depth: 2000 m*" whereas the entry for "Brouwer Trough" includes *Relief: approx. 1100 m, from 5200 m to 6300 m* in the comments field. This makes it difficult for users to query information based on a features unique characteristics e.g. locate all seamounts shallower than 200 m.

Figure 2 illustrates how separate feature classes for a Seamount and Trough might be modelled.

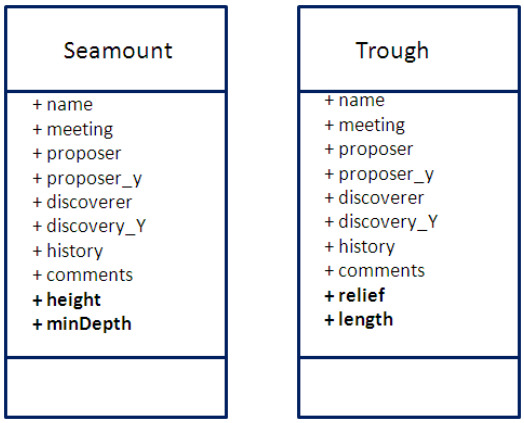

Figure 2

If SCUFN is to extend the current feature model, it should consider basing the next version of the UFN model on the current IHO S-100 standard framework. S-100 is based on the ISO 19100 series of standards, and would provide an adequate framework for developing a UFN product specification. This would include descriptions of items such as the overall model, geometry types, metadata, encoding format, feature catalogue etc …

Furthermore, it is proposed that the SCUFN undersea feature type definitions will be of interest to other user communities and should be included (registered) in the IHO S-100 GI Registry so that they can be easily discovered and used in other GIS products. It should be noted that some features described in the SCUFN feature definitions list overlap with some existing S-57 / S-100 feature definitions in the Registry, and these discrepancies will need to be resolved. Some examples are shown in table 1 below.

<table>
<tr><th>SCUFN Undersea feature terms and definitions</th><th>S-57 / S-100 Registry – HYDRO Domain</th></tr>
<tr><td>Generic terms and definitions</td><td></td></tr>
<tr><td>Shelf: The flat or gently sloping region adjacent to a continent or around an island that extends from the low water line to a depth, generally about 200m, where there is a marked increase in downward slope.</td><td rowspan="3">Continental shelf area: The continental shelf of a coastal State comprises the sea bed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend out to that distance. (IHO Publication S-51)</td></tr>
<tr><td>Generic terms used for harmonization with other gazetters and definitions</td></tr>
<tr><td>Continental Shelf: The flat or gently sloping region adjacent to a continent or around an island that extends from the low water line to a depth, generally about 200m, where there is a marked increase in downward slope. Also called SHELF.</td></tr>
</table>

Table 1

Further to the definitions listed above, IHO Publication S-32 – *Hydrographic Dictionary* also includes some different definition:

Continental Shelf

1. A zone adjacent to a continent (or around an island), extending from the low water line to the depth at which there is usually a marked increase of slope to greater depth. See shelf.

2. In UNCLOS Article 76:- The continental shelf of a coastal State comprises the sea bed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baseline(s) from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend out to that distance.

The IHO Hydrographic Dictionary Working Group has been invited to consider updating the definitions included in the Dictionary in accordance with the definitions in B-6.

Recommendation

It is proposed that;

- SCUFN should consider including their undersea features type definitions in the IHO S-100 GI Registry so that they are accessible to other communities that may wish to use them;

- SCUFN should formalise the property (attribute) types used in the UFN database, and register these in the IHO Registry. (This task should take account of similar attribute definitions already in the Registry and should include “type” definitions e.g. integer, real, string etc …).
- SCUFN should consider describing the UFN database in terms of an S-100 product specification, in liaison with the appropriate HSSC Working Group (currently TSMAD).
- GEBCO (and SCUFN) should consider whether the undersea feature definitions should be included with one of the existing domains (e.g. HYDRO), or whether the establishment of a domain specific to GEBCO should be considered – taking into account the management implications.