

Paper for Consideration by TSMAD28

Clarifications in S-102 Bathymetry Surface Product Specification Edition 1.0.0

Submitted by:	CARIS
Executive Summary:	Discussion of the issues encountered with implementing the S-102 specification into production tools. This paper seeks to encourage the organization of a technical working group meeting to clarify the role of the BAG format and to recommend the development of a physical model for the metadata in the specification.
Related Documents:	IHO S-102 (Bathymetry Surface Product Specification Edition 1.0.0) IHO S-100 (Universal Hydrographic Data Model 1.0.0) TSMAD 27 paper 4.3.2A (S-100_Metadata_Schema_update)
Related Projects:	N/A

Introduction / Background

CARIS is working on implementing tools for the creation of S-102 products. In the course of creating the XML schema for the S-102 metadata, a number of issues were identified. As well, the use within the specification of the Bathymetry Attributed Grid (BAG) specification interchangeably with S-102 raises a number of concerns.

Analysis/Discussion

1. Clarification of the role of the BAG

On page 7, it states “The Bathymetric Surface Data Product specification defines a content model and exchange file format for the exchange of bathymetric coverage data. The coverage type is a quadrilateral grid coverage together with attributes known as a Bathymetric Attributed Grid (BAG).” and the document goes on throughout the ‘Scope general’ section to describe BAG. Are S-102 product and BAG meant to be interchangeable entities? This impression is reinforced throughout the document, specifically in sections 8.1, 8.2 and 9.3, however is made ambiguous by the statement in section 12.1 where the concept of separating the “carrier” from the “content” is expressed and future considerations for other encoding is discussed.

If S-102 and BAG are synonymous, it brings to mind a number of issues that will be encountered as the Navigation Surface Working Group evolves BAG in terms of techniques and content. Issues such as, but not limited to:

- Will all aspects of BAG be automatically integrated into S-102?
- Would extensions to the BAG format have to be approved by IHO?

Recommendation: The specification should be updated to list BAG as a compatible encoding and references to BAG where it is used synonymously as S-102 should be removed. Also, impose a separation between HDF5 encoding requirements from BAG specifically in Annex A. The specification should be updated through collaboration in a technical working group. CARIS would be happy to participate in this process.

2. Metadata Profile

The product specification contains extensive sections (see sections 9.2.5, 9.2.6, 9.2.7, 9.2.8, 9.2.9 and 9.2.10) on metadata. The sections describe a logical model for metadata. No guidance is provided on how to physically instantiate the metadata. Guidance on how to instantiate the metadata would facilitate interoperability, allowing data providers and consumers to develop software components to handle the metadata. An appropriate approach would be to base an implementation on the standardized ISO 19139 XSD schemas. The implementation of the S-100 profile is based on ISO 19139 (see IHO Universal Data Model, S-100 version 1.0.0 page 4).

CARIS has attempted to produce an XML schema for the S-102 metadata. The goal was to closely align the schema with ISO/TS 19139 (the XML encoding standard for the ISO 19115 logical metadata model). The addition of specific S-102 types (e.g. see the class S102_BAGDataIdentification in Figure 5) means that an extension to the ISO 19115 / ISO 19139 model is needed. This means that the production of guidance needs some consideration because it is not simply a case of indicating that the standard ISO 19139 schemas should be used: an extended schema must be created which leads to questions of what namespace should be used, where the schemas should be published and so forth. These issues are not insurmountable because it should be noted that

the BAG metadata schemas also require extensions. The S-102 metadata model also makes reference to S-100 types but there is no framework S-100 metadata schema to derive from.

Recommendation: The development of the schemas raised many questions about the model in S-102 version 1.0.0. Guidance on how to instantiate the model should be produced and CARIS would be happy to share its findings in producing its schema to aid this process. The guidance must be produced by a consensus approach and may result in changes to the logical model in S-102. The guidance should include the production of an XSD schema, if XML is chosen as the carrier format for the metadata.

Recommendation: It was found that some S-100 types that are expressed in the S-102 model are not defined in S-100 (see IHO Universal Data Model, S-100 version 1.0.0, January 2010). An example is S102_Tile (see Figure 8) which refers to S100_Tile. There appears to be no definition of S100_Tile in the S-100 document. The S-102 metadata model should be reviewed from the perspective of S-100. Note that a paper was presented at TSMAD 27 with recommendations around the need for metadata schemas within S-100 (TSMAD 27 paper 4.3.2A http://www.iho.int/mtg_docs/com_wg/TSMAD/TSMAD27/TSMAD27-4.3.2A_S-100_Metadata_Schema_update.pdf).

Conclusions

Clarification on the use and role of BAG within the S-102 specification is needed. Guidance on how to instantiate the model should be added to the specification and the S-102 metadata model should be reviewed in context of S-100.

Recommendations

Recommend that issues be resolved by consensus in a technical working group meeting or by correspondence. If TSMAD recommends that a meeting should be arranged, CARIS would be willing to host such a gathering.

The technical working group meeting should seek to:

- Rework the specification to have BAG be listed as a compatible encoding but not used interchangeably in the specification text. These would require a v1.x.x release of the document.
- Provide guidance on how to instantiate the model should be produced and CARIS would be happy to share its findings in producing its schema to aid this process. The guidance must be produced by a consensus approach and may result in changes to the logical model in S-102. The guidance should include the production of an XSD schema, if XML is chosen as the carrier format for the metadata.
- Resolve the use of types expressed in the S-102 model but not defined in S-100.

Justification and Impacts

If issues are not resolved, implementation of the specification into production tools is difficult and left open to interpretation. Implementation by different vendors may be inconsistent and incompatible.

Action Required of TSMAD

The TSMAD is invited to:

- a. discuss the above items..
- b. endorse the creation of a new version of S-102 be prepared by technical working group that addresses the above items through correspondence or physical meeting.