

Paper for consideration by IHO S-100WG3**S-121 product specification update**

Submitted by:	S-121 Project Team
Executive Summary:	S-121 Status update
Related Documents:	S-100, ISO 19152
Related Projects:	

Introduction / Background:

S121 is a product specification for Marine Limits and Boundaries for the administration of the marine domain. It allows for the representation of marine areas and their associated rights restrictions and responsibilities in alignment with the UN Convention on the Law of the Sea (UNCLOS) while also allowing freedom for States to represent their claims and views. The standard is based on S-100 and also in the ISO standard 19152 Land Administrative Domain Model.

One of the unique features of S-121 is its applicability outside the core domain of hydrography. Although S-121 contains much content which is hydrographic in nature (because of the widespread use of navigational charts within the international LOS community), there are extensive links to the wider geospatial/legal community in connection with LADM. In response to these links in December 2016 the S-121 PT decided to adopt within the core model elements which would allow interoperability with LADM data and which would align the model with these wider standards.

Meetings:

Since the last S-100WG meeting the following meetings have taken place.

March 28-29	Full S-121PT group meeting via teleconference
December 4-8 2017	Face to Face S-121 Project Team meeting
September 20-21 2017	Full S-121PT group meeting via teleconference

Documents: <https://bit.ly/2GuEr4T>

All documentation and minutes for the S-121 meetings are available at the project team's website <http://www.s-121.com>.

Additionally, members of the project team have presented work at:

- The OGC Marine Domain Working (MDWG) meeting in conjunction with the IHO MSDIWG meeting in Niteroi, Brazil.
- ISO TC211 meeting in Wellington New Zealand
- An LADM day workshop at the World Bank in Washington DC.

The project's editorial team meet remotely on a weekly basis to assess progress.

Drafting Status:

- The product specification is largely complete. Significant achievements to date have been the acceptance by the project team of the S-121 data model, the definitions contained within it and example implementations of the model within commercial GIS systems with realistic test data from participating member states.
- Outstanding is a complete and legally acceptable encoding format - the primary use case for which is DOALOS deposit. Although this is a basic encoding the complexities of its production and acceptability are numerous. Much progress has been made in this area, mainly based on extant examples which most member states have access to for reference.

The current finalised draft of S-121 Version 1.0 is submitted to the S-100WG for review and input as part of its submission, ultimately, to HSSC in May 2018. The following documents are submitted to the S-100WG for wider review now that a review by the S-121PT has taken place:

1. [Draft Product Specification](#)
2. [Derivation of Classes](#)
3. [Encoding](#)
4. [Feature Model](#)

These documents, along with a reference version of the S-121 model are available at the project website:

<http://www.s-121.com/w/index.php/Documents>

OGC Pilot:

The S-121 project team presented at the OGCs Technical Committee in Southampton,UK in September. Following this a proposal was made to carry out an OGC pilot study in order to perform the following tasks:

- Development of fully interoperable GIS implementations of the emerging S-121 standard
- Implement a legal dissemination format that is human readable, in accordance with the S-121 specification and which is suitable for deposit with UN DOALOS.
- Development of a GML based exchange format to allow for the overlay of MLBs information over charts including its portrayal.
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A presentation describing the pilot project is available from the project website at:

http://www.s-121.com/w/index.php/File:S121-OGC-Pilot_30-11-2017.pptx

And the full pilot proposal is available at:

http://www.s-121.com/w/index.php/File:OGC_S121_Pilot_Proposal_V3.1.pdf

It is envisaged that the OGC pilot project, currently at proposal stage, will help S-121 mature into a standard with applicability outside the primary use cases and will perform a valuable testbed activity by independently verifying the model and its implementation within many

systems. The OGC's emphasis on interoperability and web services will help promulgate the S-121 standard.

Next steps and significant gaps:

The S-121 document contains a first draft of the encoding which is suitable for version 1 of the standard but a finished, universal, and legally consistent encoding acceptable to UN DOALOS remains to be finalised. This is also a task under the OGC pilot.

No portrayal has yet been specified for the S-121 features. Full portrayal specifications will be developed during the OGC pilot project and fed into the next version of the product specification. It should be noted that a fixed portrayal catalogue is not required for the primary use case of UNCLOS deposit with UN DOALOS.

As the data model for the S-121 standard is now complete it would be appropriate to submit to the IHO registry the features and attributes defined within the S-121 feature catalogue. Support to the IHO registry manager will be required from the S-121 editorial team to ensure:

- The resolution of duplicate features already extant within the IHO registry due to their inclusion in standard navigational products
- The concrete definition of MLB features in line with their UNCLOS definitions.
- Introduction of new features and attributes where required to express the S-121 data model.

Although a large number of entries are envisaged to the registry (approximately 180 with approx 100 codelist entries) the S-121 team believe these are necessary to express the full range of features defined within UNCLOS and the data model defined during the S-121 drafting process.

Recommendations:

The S-100WG is asked to:

1. Note the contents of this report.
2. Review and comment on the first edition of the S-121 standard and to feedback comments in time for the documents to be updated prior to HSSC submission in May 2018
3. Assign IHO registry resources to assess the work required to import the S-121 feature set into the registry and start the process
4. Note the liaison between the OGC and the IHO project team in order to ensure maximum take up of the standard and its independent verification. The S-100WG is asked to promote the OGC pilot project to encourage sponsorship from interested member states.