

# Minutes of the fourth S121 Project Team meeting

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*Hosted at DOALOS, United Nations Headquarters, New York, December 4<sup>th</sup>-8<sup>th</sup>, 2017*

## Contents

1. Abstract .....	4
2. Acronyms, Terms & Definitions.....	5
3. Participants.....	6
4. Acknowledgments.....	7
5. Agenda.....	8
6. S121 Agenda Item: Opening and Administrative Arrangements.....	8
7. S121 Agenda Item: Approval of the Agenda.....	8
8. S121 Agenda Item: Summary .....	8
8.1. Overview of past activities .....	8
8.2. S-121 requirements and goals. ....	8
8.3. UNCLOS requirements .....	8
8.4. Leveraging S100 and ISO19152 structures.....	9
9. S121 Agenda Item: Overview .....	9
9.1. S-121 Web site.....	9
9.2. S-121 Data Model.....	9
9.3. S-121 Implementation.....	10
9.4. S-121 Exchange Format.....	10
10. S121 Agenda Item: Presentation of Stakeholders Implementation/Requirements.....	11
10.1. Theoretical Approach .....	11
10.2. Australian Approach.....	11
10.3. Canadian Approach .....	11
10.4. French Approach .....	11
11. S121 Agenda Item: Administration & Strategies .....	12
11.1. S-121 Encoding refinement strategy.....	12
11.1.1. Define usable, simple, flexible encoding for exchange and deposits .....	12
11.1.2. Data encoding guide with examples .....	12
11.2. S-121 Validation .....	12
11.2.1. Conforming with the standards structure.....	12
11.2.2. Conforming with UNCLOS (objects and language).....	12
11.2.3. Conforming with minimal deposit requirements.....	12
11.2.4. Conforming with State defined requirements .....	12
11.3. S-121 Portrayal .....	12

11.3.1.	For charting (ensure proper depiction in S-101).....	12
11.3.2.	For mapping .....	13
11.4.	S-121 Metadata .....	13
11.4.1.	Description requirements and usages .....	13
11.5.	S-121 Integration with S-100.....	13
11.5.1.	S-121 alignment with S-100 (Product specification & S-100 template) .....	13
11.5.2.	Interfacing with the IHO registry and S-32 Dictionary .....	14
11.5.3.	Feature Catalogue Registration Status Report.....	14
12.	S121 Agenda Item: Way forward & Strategies .....	14
12.1.	S-121 OGC Pilot Project Draft Approval .....	14
12.2.	S-121 Adoption Target: HSSC 10 .....	14
12.3.	2018 Next Meetings .....	14
12.4.	S-121 Administration.....	15
13.	S121 Agenda Item: Other items of discussion and actions.....	15

## 1. Abstract

The main goal of this meeting was to review the progress that the project team has made this year and plan ahead.

The status of the S-121 project team is “On-track” with its delivery objectives and aims to deliver a first version of the standard at the next HSSC 10. During the course of this meeting all agenda items were covered, and are addressed in these minutes. The S-121 Project Team indicated that it was extremely pleased with the progress in the development of the standard.

## 2. Acronyms, Terms & Definitions

- ABLOS: Advisory Board on the Law of the Sea
- DOALOS: Division for Ocean Affairs and the Law of the Sea
- FIG : *Fédération Internationale des Géomètres (International Federation of Surveyors)*
- LADM: Land Administrative Domain Model (ISO 19152)
- HO: Hydrographic Office
- HSSC: Hydrographic Service and Standards Committee (of the IHO)
- IHB: International Hydrographic Bureau
- ISO19152: ISO 19152 Land Administration Domain Model
- MLB: Maritime Limits and Boundaries
- MSDI: Marine Spatial Data Infrastructure
- UNCLOS: United Nations Convention on the Law of the Sea
- S100: IHO S100 The Universal Hydrographic Data Model
- S121: S121 Product Specification on Maritime Limits and Boundaries
- S121 Data Model: The foundation portion of the standard enabling States to encode their MLB in a digital format
- S121 Encodings: Technical descriptions defining how the information stored in the S121 Data Model can be reformatted programmatically to generate the S121 Exchange Formats
- S121 Exchange Formats: The file formats used to express the information contained in the S121 Data Model
- S121 Feature Objects: The S121 standard components used to describe the MLB core objects. These features objects are attributed based on whether they are location, limit or zone, and they can be described conceptually or spatially by points, curves, surfaces, or by text. They are recorded in the S100 Register.
- S121 Information Objects: The S121 standard components used to describe administrative, source and party objects.
- S121 Objects: There are two main types of objects, S121 Information Objects and S121 Feature Objects.
- S121 Product Specification: A standardized document used to provide a detailed description of a **dataset** or **dataset series** together with additional information that will enable it to be created, supplied to and used by another party.
- S121 PT: S121 Project Team
- S121 Use Cases: Practical usages that will be made of the standard. These S121 Use Cases generally lead to the definitions of specific S121 Encodings, and S121 Exchange Formats
- TOR: S121 Project Team Terms of Reference

### 3. Participants

Code	Member State / Organ	Organization	Title	Family Name	First Name	E-mail	Face 2 Face Meeting 4-8th December 2017
QZHO	Australia	Geoscience Australia	Mr.	ZHONG	Qing	Qing.Zhong@ga.gov.au	x
MALC	Australia (Chair)	Geoscience Australia	Mr.	ALCOCK	Mark	Mark.Alcock@ga.gov.au	x
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SDUR	Canada (Vice-Chair)	Canadian Hydrographic Service - HO	Mr.	DURAND	Sébastien	Sebastien.Durand@dfo-mpo.gc.ca	x
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DMOR	Teledyne - Caris	Teledyne - Caris	Mr.	MORASH	Dan	Dan.Morash@caris.com	Online

## 4. Acknowledgments

The chair and vice-chair of the Project Team wish to acknowledge the contributions made by the Project Team members both in preparation and during this meeting.

The S121PT wants to especially thank:

- Mr. Douglas O'Brien for his dedication and deep knowledge which allowed us to create this solid standard model.
- Mr. Qing Zhong for his impressive capacity to make this standard real enabling us to quickly realize, change and update the model's implementation, population and testing.
- Mr. Rob Morrison and Mme. Marisa Ramey for the implementation of all tables testing against known software.

Thanks for all of your work, if you have any request or inquiries we will be happy to answer them.

Regards,

Mark Alcock (S121PT Chair)

Sébastien Durand (S121PT Vice-Chair/Secretary).

## 5. Agenda

The agenda can be accessed here: <http://www.s-121.com/w/images/9/91/S121PT4-Agenda.xlsx> and was accepted by the project.

## 6. S121 Agenda Item: Opening and Administrative Arrangements

The session was opened by the Chair, Vice-chair and by DOALOS, our host welcoming participants. The decision was made to keep the meeting as informal as possible to promote open communication. On the second day a welcome was given by Mr Vladimir Jares, Deputy Director of DOALOS.

## 7. S121 Agenda Item: Approval of the Agenda

The agenda was approved by all members

## 8. S121 Agenda Item: Summary

### 8.1. Overview of past activities

- SDUR briefed members on the presentation that was made during the twenty-seventh Meeting of State Parties to UNCLOS in June 2017 to inform State Parties of the progress being made to date and the feedback received.
- SDUR gave the presentation that was made by the project team at HSSC 9 to illustrate what was achieved in the last year as well as to describe the upcoming objectives in the very short term. The presentation can be found here: [http://www.s-121.com/w/images/9/96/S121\\_HSSC\\_November2017\\_V3.pptx](http://www.s-121.com/w/images/9/96/S121_HSSC_November2017_V3.pptx)

### 8.2. S-121 requirements and goals.

- Based on the previous presentation (see the last slides), the meeting requirements and objectives are to :
  - Fine-tune the model with all stakeholders based on the members' review.
  - Agree on the maturity status of the proposed data model.
  - Reach an agreement on the path forward to define a proper deposit exchange format
  - Begin discussions on symbology/portrayal/overlay.
  - Reach an agreement on the OGC pilot strategy

### 8.3. UNCLOS requirements

DOALOS (RSAN and SSTA) S-121 project team members made a presentation that can be reached here [http://www.s-121.com/w/images/9/94/20171204\\_doalos\\_GIS\\_S121\\_4th.ppt](http://www.s-121.com/w/images/9/94/20171204_doalos_GIS_S121_4th.ppt)

This presentation was quite informative and highlighted one of the main requirements shaping the reason as to why the IHO and the S121PT are attempting to generate a standard which is GIS compatible (Slide 6). DOALOS also clearly showcased their TEST WEB PORTAL. Doing so, the

need was shown, to enable in the deposit format, the description of the object/features using a global reference frame (WGS84). It is the States depositing this information, who are expected to do this conversion and provide the global coordinates along with their local coordinates if used.

The team also inquired to get access to the MLB portal, and DOALOS informed us that they would provide access to any S121PT member upon request or could even share this credential information with the secretary who would then share it within the S121PT.

- **[ACTION]:** RSAN to provide credential for access to the DOALOS site to the S121PT

#### 8.4. Leveraging S100 and ISO19152 structures

Since this discussion is highly documented in the S-121.com web pages and was briefly covered in the summary presentation, the team moved forward without further comments.

### 9. S121 Agenda Item: Overview

#### 9.1. S-121 Web site

The web site was presented to all members and SDUR navigated through the tabs and did a brief presentation of the contents. The goals of the website were clearly stated:

- To provide a dynamic and transparent means of communication.
- The web site aims to be simple and efficiently deliver documents and content to the users.

The web site was confirmed as being extremely useful. LSNY recommended that the meeting documentation be found on the documents page, and that the main documents should also be found on the IHO web site.

- **[ACTION]** Merge the meeting documentation with the document page
- **[ACTION]** Provide to IHB (Antony Pharaoh) the S121PT4 and the link to the S-121.com
- **[ACTION]** Add link to DOALOS web pages, and test portal

#### 9.2. S-121 Data Model

The first term of reference for the S121PT was to define a suitable data model that can support the administration of MLB information. After asking if there was anything missing in the data model, every S121PT State member confirmed that, to their knowledge, the S-121 Data model was mature enough to be proposed. None of the States present could find deficiencies in the current model but it was stated that until the model is fully tested by different States and other users that there will be no way of addressing this any further.

As a result, in order for the S121PT to continue its advancement, the S121PT considered that the latest version of the model developed at the end of this S121PT4 is now version 1.0. (Links are to be provided shortly).

### 9.3. S-121 Implementation

The strategy taken by the S121PT was:

1. To create a test example of the data model to evaluate the relationships and the structure of the model. (Theoretical Approach discussed below.)
  2. To populate the entire model for testing purpose and support the creation of either simple or complex exchange deposits.
    - a. Australia can provide this empty data model online or data model with populated data for S121PT members who requests it. It is to be noted that this model is for development purpose only. It is not to be considered as official Australian data.
  3. Once the first exchange deposit is created in compliance with the data model, a guideline document will be created to support S121PT members and other users.
- **[ACTION]** The identified mandatory fields need to be reviewed and marked in both the model and in the ARCGIS Examples.

### 9.4. S-121 Exchange Format

The primary use case and second terms of reference is to define a suitable exchange format for a State to deposit its MLB to DOALOS. As defined in previous meetings and the S121PT4, the requirement for many States who deposit their MLB is legibility and self-support. In essence the deposit format must be usable as a legal document.

The minimal requirements of a deposit included in the *note verbale* to DOALOS is to provide who is submitting the MLB, what MLB object is being submitted, a list of coordinates defining the MLB, and the datum associated with these coordinates.

Based on the State requirements and the resolution adopted by the General Assembly, the minimal/mandatory information that needs to be found in an exchange format is listed in the following table: [http://www.s-121.com/w/images/a/a5/S121\\_Exchange\\_format.xlsx](http://www.s-121.com/w/images/a/a5/S121_Exchange_format.xlsx)

These mandatory items that compose the exchange format minimum content are based on UNCLOS requirements and then tailored to best fit the UN-General Assembly resolution A/RES/59/24, 4 February 2005.

Many “textual” formats are being proposed and could be selected for the S-121 Deposit format. These are CSV, RTF, TXT, DOCx. These are considered potential formats mainly because they all can be read without the assistance of specialized software, and they are open to the general use. As it stands, the S121 development team will focus on the RTF and CSV file for the upcoming testing, but a mention will be made in the OGC pilot project (discussed later) to evaluate these other formats.

It is to be said that the development of such exchange format requires some parallel work. It is in fact highly suggested that as the States develop their exchange format example that they consult with their legal departments to gather the requirements which will drive the production of an exchange format fit for purpose.

## 10.S121 Agenda Item: Presentation of Stakeholders Implementation/Requirements

### 10.1. Theoretical Approach

The S-121 full implementation model published with ArcGIS online was demonstrated to showcase that the relationship model is a viable solution to support the administration of MLB objects. It is to be noted that the model tested was not final and contained additional attributes not relevant to the standard. This example was to showcase the relationships between the different tables of the model. It is expected that a new set of tools will be developed to facilitate navigation and information query.

### 10.2. Australian Approach

Australia has realised and populated the complete physical model to showcase and test the model to its fullest extent. Doing so allows for the extraction of either all or only a subset of the information into the deposit format for testing.

QZON demonstrated how the ArcGIS model was realised and populated. The model schema was developed in a very generic way so that it can be easily implemented with other GIS systems

- **[ACTION]** The empty schema of this model implementation within ArcGIS will be made available on the web site.
- **[ACTION]** The unofficial populated Australian model will be made available to the S121PT members upon request (please contact MALC).

### 10.3. Canadian Approach

There was no Canadian example provided since all the efforts were put on the creation of the theoretical approach.

### 10.4. French Approach

Marc or Julien, can you fill this section please my notes were scarce

## 11. S121 Agenda Item: Administration & Strategies

### 11.1. S-121 Encoding refinement strategy.

#### 11.1.1. Define usable, simple, flexible encoding for exchange and deposits

JPRI gave a presentation on the proposed strategy to achieve a proper encoding to support deposits of MLB to DOALOS. In essence, in his presentation, JPRI confirmed and acknowledged the path laid down by the S-121 project team to support the creation of a Unicode human/computer-readable format to support States' deposits to DOALOS.

See [http://www.s-121.com/w/images/1/13/A\\_few\\_thoughts\\_on\\_encoding.docx](http://www.s-121.com/w/images/1/13/A_few_thoughts_on_encoding.docx).

#### 11.1.2. Data encoding guide with examples

- **[ACTION]** As soon as the S121PT has defined the proposed exchange format, a data encoding guide with examples will be made available on the web page.

### 11.2. S-121 Validation

#### 11.2.1. Conforming with the standards structure

The idea is to produce encoding to automatically generate from the data model an exchange format that can read back into a GIS system. The requirement is to ensure that the necessary information is preserved within the exchange format to ensure readability from a computer supporting backward compatibility with GIS systems.

#### 11.2.2. Conforming with UNCLOS (objects and language)

The data model as developed has already addressed this requirement. The core features defined are all defined by reference to UNCLOS articles.

- **[ACTION]** As States are testing and are implementing the model, they may find some attribute descriptions unclear. It is needed that these concerns are reported back to the project team in order to facilitate their clarification.

#### 11.2.3. Conforming with minimal deposit requirements

See the Table developed during the meeting: [http://www.s-121.com/w/images/a/a5/S121\\_Exchange\\_format.xlsx](http://www.s-121.com/w/images/a/a5/S121_Exchange_format.xlsx)

#### 11.2.4. Conforming with State defined requirements

The S-121 Model supports the creation of State-specific objects. Examples will be made on how to manage such objects and integrate them in the encoding and exchange formats. Such an example will be found in the guideline document to be created.

- **[ACTION]** Integrate a State Specific Example in the Guideline document]

### 11.3. S-121 Portrayal

#### 11.3.1. For charting (ensure proper depiction in S-101)

A report will be provided to the S-100WG describing the recommendation of the S-121PT.

These recommendations are two fold:

- 1- Generate an additional layer “AL” (similar to the “AML” but not military) using GML 3.2.1, an MLB AL to support the proper depiction of MLBs on an ENC without affecting navigation. This format would have the capacity to hold all of the S-121 Model content.
  - 2- Provide recommendations on all MLB core feature objects that need to be added to the S-101 catalogue and provide update on the feature definition and attribution. This will have to be done in collaboration with the S-101.
- **[ACTION]** Draft/Review/Submit the report to S100WG

### 11.3.2. For mapping

Working with MLB involves the need to depict the information against one another or against other datasets to make it truly useful. The S121PT realizes this requirement which exceeds the more targeted navigation use cases. As a result, the S121PT agrees to define a portrayal component to this standard to support more generic GIS and Web use cases.

- **[Action]** This action was postponed to a later stage of the development and should be addressed again in the next S121PT meeting.

## 11.4. S-121 Metadata

### 11.4.1. Description requirements and usages

The metadata that is required in an S121 data product is already defined in the S-100 standard Part 4. The mandatory metadata must be provided in a dataset. In an Additional Layer such as recommended in 11.3.1.1 above, The metadata must be provided in an XML form (such as an additional file or as part of a GML file). In a human readable text encoding, such as that required for a deposit to DOALOS, much of the metadata will be included within the legal text. An auxiliary XML file containing the metadata and a reference to the text file is required so that the dataset can be found using a catalogue service for the web as part of a MSDI.

## 11.5. S-121 Integration with S-100

### 11.5.1. S-121 alignment with S-100 (Product specification & S-100 template)

The current version of the S-121 Product Specification is using the official S-100 Product Specification Template per S-100 version 2 as provided by the S-100 WG. The Product Specification will be reviewed against the latest version of the S-100 Product Specification Template and adjusted as required.

The terminology used in the S-121 Product Specification makes use of the ISO TC211 International Glossary of Terms (which compiles terms from all of the ISO TC211 standards) as its primary source and the IHO S-100 Universal Hydrographic Model for any additional terms relates to S-100. Additional terms are defined in S-121 where required.

### 11.5.2. Interfacing with the IHO registry and S-32 Dictionary

Comments were provided by email to the S-32 Dictionary. A follow-up is needed to identify advancement done, and connect with the groups (ABLOS) who are addressing this requirement.

- **[ACTION]** FBLO to follow up on the S-32 issue with ABLOS and communicate the responsible name to SDUR.
- **[ACTION]** S121PT is to continue communication on this topic.

### 11.5.3. Feature Catalogue Registration Status Report

The third element of the S121PT terms of reference is to identify gaps in S-100. The current data model was developed around S-100 and ISO 19152. The fact that the model is now considered mature enables the project team to generate this report that will be drafted/reviewed and then sent to the S-100WG. This report will describe the requirements of S-121, and list the features and attributes that are needed to be implemented in the S-100 feature catalogue.

- **[ACTION]** Provide a report to the S-100 WG to register the S-121 features and attributes.

## 12. S121 Agenda Item: Way forward & Strategies

### 12.1. S-121 OGC Pilot Project Draft Approval

SDUR presented the draft OGC S-121 Pilot project. Based on the result of this meeting, this draft needs to be updated and further reviewed. This strategy is to be developed parallel to the S121 standard advancement and should not impact the release of the standard, but will enable the transparent involvement of the industry and help trigger further development and recommendations relative to the S121 standard. This is the most cost-effective way forward to see the standard implemented and used within industry and within the marine domain. The S121PT agreed to this strategy.

- **[ACTION]** Refine/Review/Start the OGC Pilot project.

### 12.2. S-121 Adoption Target: HSSC 10

Considering the level of advancement of the standard, the S121PT realizes it would be a challenge to meet the HSSC 10 but nonetheless agrees to aim to deliver the S121 standard 1.0 at HSSC10.

### 12.3. 2018 Next Meetings

The S121PT agrees to have 2 WebEx meetings in the coming year, and one face-to-face meeting in the same time frame as the S121PT4. Unless proposed otherwise the next face-to-face meeting will be held at UN-Headquarters-DOALOS, New York, USA.

#### 12.4. S-121 Administration

No comments made.

### 13.S121 Agenda Item: Other items of discussion and actions

There was a short discussion on the importance of densification of features, in ensuring the proper representation of MLB, there seems to be a common agreement on the methodology to archive such densification which is to calculate the densification point to a density that will provide a cord to arc distance no greater than one metre.

- **[Action]** Provide guidance and relevant document on how to calculate 1m cord to arc and on how to obtain properly densified lines

There was also a very brief discussion on coordinate accuracies. This discussion should be either raised again or acknowledged through the implementation guidance document.

- **[Action]** Provide guidance that addresses the coordinates minimum precision or bring this topic to the next meeting.

The use case scenario needs to be rewritten to better describe the task and expectations.

- **[Action]** Review and redefine where necessary the use case scenarios to better represent the goal of this standard.