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EXPERT TEAM ON SEA ICE (ETSI)
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DRAFT

REVIEW OF SIGRID-3 VERSION 3.1
(Submitted by ETSI Chair)

Summary and Purpose of Document

This document describes additions to version 3.0 of SIGRID-3 (Sea Ice GeoReferenced Information and Data, JCOMM-TR-023, WMO/TD-NO.1214), an evolution of the SIGRID series of standards for coding, exchange and archiving of digital ice charts, adopted in in May 2014.
Version 3.1 fully retains the essential structure of its predecessor and is backwards compatible with earlier versions of SIGRID-3. The important extension of Version 3.1 is to incorporate the missing attributes and new encoding for the form and size of icebergs facilitating production of the icebergs informational products at the level of national ice services as well as to ensure compatibility with the JCOMM ENCS Ice Objects Catalogue and the S-411 format for Electronic Navigation Charts (ENCs).
Other additions include time stamp additions to file naming conventions for analysis and forecast data, data source and confidence level attributes.

ACTION PROPOSED

The Expert Team on Sea Ice is invited to:

(a) Review and comment on the attached additions to SIGRID-3 Rev 3.1 Draft X;
(b) Approve the SIGRID-3 Rev 3.1 as amended at the meeting.

References: SIGRID-3 Revision 3

Appendices: A. SIGRID-3 Revision 3.1 Draft 0 (February 2017)

DISCUSSION

1.The “Sea Ice GeoReferenced Information and Data – 3 (SIGRID-3): A Vector Archive Format for Sea Ice Chart” was formally adopted as JCOMM Technical Report No. 23, as well as WMO Technical Document No. 1214. It is maintained by the JCOMM Expert Team on Sea Ice (ETSI). Although originally developed as a mechanism for national ice services to submit sea ice chart data to the World Data Centers for Glaciology, it has become increasingly used as means of exchanging float ice data between ice services and for other user applications including sea ice observations.

2. The current document describes additions to version 3.0 of SIGRID-3 (Sea Ice GeoReferenced Information and Data, JCOMM-TR-023, WMO/TD-NO.1214), an evolution of the SIGRID series of standards for coding, exchange and archiving of digital ice charts, adopted in in May 2014.

3. Version 3.1 fully retains the essential structure of its predecessor and is backwards compatible with earlier versions of SIGRID-3 with exception of new encoding for size and form of the iceberg. The Version 3.1 incorporates the missing polygon and point attributes and new encodings for size and form of the icebergs and iceberg concentration facilitating production of the icebergs informational products at the level of national ice services as well as to ensure compatibility with the JCOMM ENCS Ice Objects Catalogue and the S-411 format for Electronic Navigation Charts (ENCs).

4. To this effect following new Polygon and Point Database fields are proposed (table 1):

Table 1

Type	SIGRID-3 Field name	SIGRID-3 Field Definition	Ice Objects Catalogue Field Name	Data type	Length (bytes)	Code Table Reference
Polygon	BC	Iceberg concentration	IA_BCN	Text	2	SIGRID Table 16 (new)
Polygon	ON	The individual name of an object in English	OBJNAM	Text	6-22	
Polygon	IF	Information – textual information about an object	INFORM	Text	6-22	
Point		Maximum Length of iceberg at the waterline in meters	IA_BLN	Integer	4	
Point		Maximum Width of iceberg at the waterline in meters	IA_BWD	Integer	4	

5. To ensure compatibility between the Arctic and Southern Oceans iceberg observational practices, the new encoding of the iceberg size and form is introduced (2 bytes variables identifier BL). The iceberg size can be encoded using iceberg maximum length at waterline (table 13a) and iceberg maximum height above the sea (table 13b). The size category would be

considered as the largest dimension (either length, width or height) for that size category. For example, if the iceberg dimensions were 50 m width, 70 m length and 10 m high would be considered as a medium iceberg. Iceberg size gradations are introduced spanning interval from 'Very Large Iceberg I' (201-400 m long or 75-100 m high) to 'Very Large Iceberg IV' (>18520 m long or >151 m high). Table 13b is alternative to 13a, key to dimension selected to identify the size of iceberg is the first code which can be either a letter (table 13a used) or a number (table 13b used) The terms "weathered" and "glacier" are not specified in this table because they do not describe the shape of the iceberg."Non-Tabular" can describe Codes 3-7 or can be an iceberg that does not specifically fit into any of the other Non-Tabular categories.

6. Coding of the iceberg concentration (variable identifier BC) based on a distance between the icebergs is summarized as a new code table 16.

7. A change to file naming convention allowing using a date-time attribute (in accordance to ISO 8601 standard) for the ice analysis products and additional 'forecast time' attribute instead of a simpler date attribute. Time should be in UTC.

8. To match the Ice Objects Catalogue, some adjustments are needed for the format and codes

- separate codes within ICEAPC, ICESOD and ICEFLZ by commas

9. Lake ice codes to be added to the ice thickness categories. (table 2)

10. ICECST was removed and replaced with ICECRT and ICEPRS

11. Data Source attributes (WO, RO, BO, DO, TO) are extended to 2 bytes and 3 new codes for corresponding table 15 are proposed (Climatological, Model output – deterministic, Model output – ensemble). A new general attribute DTASRC - source of the data (measurement method or other) is proposed.

12. Further, the Team is proposed to discuss a new attribute ICEZOC for all classes of data quantifying zone of confidence for ice information. The attribute ICEZOC uses similar to existing in S-57 format CATZOC attribute approach. The ICEZOC values are calculated by the ice analysts using table 2 and 3.

Table 2

Confidence value	Resolution	Age of data	Analyst experience	Analyst confidence evaluation
5	less than 50 m	less than 24 hours old		Excellent
4	50 to 100 m	24 to 72 hours		Very good
3	100 m to 1 km	72 to 120 hours	Over 24 months	Good
2	1 km to 10 km	5 to 10 days	6monts – 24 months	Intermediate
1	10 km or more	average of 2 or more years	1 month – 6 months	Poor
0	no data	no data	Less than 1 month	Very poor

Table 3

Zone of confidence	ICEZOC value	Sum of confidence values
A1	1	Over 15
A2	2	Between 12 to 14
B	3	Between 9 to 11
C	4	Between 5 to 8
D	5	Less than 5
U	9	no data

13. Further the Team is invited to discuss:

- legibility of including derived value-added fields at the side of the ice services, like calculated numbers of colour styles and egg-code strings, to facilitate presentation of ice products in GIS (e.g. COLORCT, COLORSD)
- need for congruency of coding tables in SIGRID-3 and Ice Objects Catalogue

14. The Team is invited to review the draft of SIGRID-3 Rev 3.1, as reproduced in Appendix A, and approve it with revision if necessary.

Appendices: 1