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| **WORLD METEOROLOGICAL ORGANIZATION****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **INTERGOVERNMENTAL OCEANOGRAPHICCOMMISSION (OF UNESCO)****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| EXPERT TEAM ON SEA ICE – FIFTH SESSIONSTEERING GROUP FOR THE PROJECT GLOBAL DIGITAL SEA ICE DATA BANK (GDSIDB) – THIRTEENTH SESSIONOTTAWA, CANADA, 25 TO 28 MARCH 2014 | **ETSI-5/GDSIDB-13/Doc. x**Submitted by: Darlene LangloisDate: 15.03.2014Original Language: ENGLISH Agenda Item: 5.3.XStatus: DRAFT 1 |

**RECOmmendations for additions to sea ICE NOMENCLATURE**

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| Summary and Purpose of DocumentThis document describes some proposed general additions to the current Sea Ice Nomenclature and additions for terminology needed for the northern METAREAs. |

**ACTION PROPOSED**

 The Expert Team on Sea Ice (ETSI) is invited to:

1. Note and comment on the information provided, as appropriate;
2. Consider recommendations over the next intersessional period.

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**References:** <http://www.aari.ru/gdsidb/xml/volume1.php?lang1=0&lang2=1&arrange=0&self=0>

**Appendix**: WMO definitions related to icebergs in sea water

**DISCUSSION**

**General proposals**

1. It is proposed to discuss and agree on amendments and additions to the following terms in the WMO Sea-Ice Nomenclature:

2.7 Development of lake ice – not a definition, does not fit with other phrases. Consider changes to definition.

3.1 Fast ice – Consider following changes to definition:

Fast ice: Sea ice which forms and remains fast along the coast, ~~where it is attached to the shore~~, to an ice wall, to an ice front, between shoals or grounded icebergs. Vertical fluctuations may be observed during changes of sea-level. Fast ice usually forms first along the shore and then grows seaward. It may extend a few metres or several hundred kilometres from the coast. ~~may be formed in situ from sea water or by~~ Ice floes formed elsewhere may become incorporated in the fast ice. ~~freezing of floating ice of any age to the shore, and~~ Fast ice may be more than one year old and may then be prefixed with the appropriate age category (old, second-year, or multi-year). If it is thicker than about 2 m above sea-level it is called an ice shelf.

4.2.7 Discussion needed for definition (see paragraph 2)

4.3.7 Consider changes to english version to make it sound better and remove the word "weathered" since it isn't a shape descriptor.

Iceberg: Cf. 10.4.2 - A massive piece of ice of greatly varying shape **and size**, protruding more than 5 m above sea-level, which has broken away from a glacier, and which may be afloat or aground. Icebergs may be described as tabular, dome-shaped, sloping, pinnacled, dry-docked, blocky~~, or weathered. in addition to having a size qualifier.~~

4.3.7.1 – 4.3.7.8 Consider regrouping of terms to make classification more physical (e.g. flat-topped group, irregular group).

4.4.8.1.1 Consider slight change to the English (added an "A" to the second use of jammed brash barrier.

7.2.1 Consider change in the English version:

Fractures concentration: Proportion of fractures in an ice area. ~~Degree of disunity in an ice area.~~

8.8 Consider change to definition as frost flowers are also found on fresh water ice:

Frost flowers: A growth of ice crystals by condensation from the atmosphere at points on the surface of young ice. After formation, sea water may be drawn through the ice into the flowers. These delicate~~, highly saline~~ crystals effectively roughen the surface, often dramatically altering the appearance of the ice in microwave remote sensing imagery.

Section 10:

Consider removal/merging of terms 10.4.2.1, 10.4.2.2, 10.4.2.3, 10.4.3, 10.4.4 and 10.4.5 since they repeat in sections 4.3 and 4.4.

**Icebergs and bergy waters**

2. Withthe requirement to provide MSI, bulletins are issued twice per day with information about the position of the ice edge, total concentration, stages of development and other hazards that would include icebergs. Current terminology for icebergs is limited to either very open waters or within fast ice. There is no standard for terminology that describes icebergs within higher concentrations of mobile sea ice. Since this condition exists in many parts of the northern METAREAs, it would be beneficial to develop standard phrases.

3. Icebergs can be present by themselves or within sea ice. If there are icebergs within pack ice, such in Baffin Bay, there is no official terminology. The Canadian Ice Service has separate bulletins for sea ice and icebergs and describes icebergs by the number per marine area.

4. The categories are:

No confirmed icebergs

Less than 10 icebergs

10 to 25 icebergs

26 to 50 icebergs

51 to 100 icebergs

More than 100 icebergs

Unknown number of icebergs (for areas that are not actively monitored but climatologically we would expect icebergs to be located.)

5. For the METAREA bulletins we will be combining the sea ice and iceberg information in one bulletin and are looking to standardize the terminology used in the Arctic. Information should be conveyed to the mariner that either icebergs are present or they are likely to be present in areas with more than 1/10 of sea ice.

Bergy water - <1/10 sea ice + few icebergs

Ice tongue - 8-10/10 sea ice + many icebergs

\_\_\_\_\_\_\_\_\_ ? 1/10 to 10/10 sea ice + few icebergs

6. Some possible phrases are:

Bergy sea ice

Icebergs present (high confidence)

Icebergs possible (low confidence)

Unknown number of icebergs

Eg. 8 tenths bergy first year ice.

 8 tenths first year ice. Icebergs possible.

 8 tenths first year ice. Icebergs present.

 8 tenths first year ice. Unknown number of icebergs.

7. The description should be short and clear to the mariner of what it means.

**Appendix** 1

WMO definitions related to icebergs in sea water

**When located in areas with little sea ice, the WMO definition is:**

Bergy water: An area of freely navigable water in which ice of land origin is present in concentrations less than 1/10. There may be sea ice present, although the total concentration of all ice shall not exceed 1/10.

**From Version 1.0 of WMO Sea Ice Nomenclature draft,**

Bergy water: A large area of navigable water in which ice of land origin is present or possible at a total concentration less than 1/10. Such zones do not usually have a clearly expressed edge or boundary WMO Sea Ice Nomenclature draft, version 1.0, p.2

with ice-free water. A characterization of ice conditions in such areas can be made both on the basis of data from direct observations, data from previous observations or from climatic data (4.2.7 Ed.).

**If there are significant numbers of icebergs, in fast ice, the WMO definition is:**

Iceberg tongue: A major accumulation of icebergs projecting from the coast held in place by grounding and joined together by fast ice.