WMO standards and guidelines for sea ice: ice charting and observations

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Procedures for sea ice standards management

- Within the WMO JCOMM ETSI is responsible for operational sea ice standards including WMO Sea Ice Nomenclature
- JCOMM ETMSS is responsible for GMDSS standards and is developing M.O.C.
  - in part of sea ice input is provided by ETSI
- By agreement with IHO TSMAD, JCOMM ETSI is the formal body responsible for the Ice Objects Catalogue with WMO Secretariat as co-manager of the catalogue
- International Ice Charting Working Group (IICWG)
  - Technical advisory body to ETSI
  - Meets annually
JCOMM ETSI is responsible body for the WMO operational sea ice standards and sea ice as a ‘media’ for operations (marine safety)
Sea ice observations: what can be coded and how can be relayed to customers?

- "WMO Sea Ice Nomenclature" (WMO No. 259, revision Mar 2010) states what sea ice [drifting and fast ice] and fresh water ice [lake ice] parameters can be described.
- WMO SIGRID [1,2,3,] and “Ice objects catalogue” describe how sea ice and fresh water ice should be described.
- Under development AARI “Manual for ice observers” and CIS MANICE or “Manual ice observations” under development.
Procedures for sea ice standards management

Top level harmonizing sea ice standard

• "WMO Sea Ice Nomenclature" (WMO No.259, revision Mar 2010)
  • Volumes 1 "Terminology" (terms and definitions)
  • Volumes 2 “Illustrated glossary”
  • Volume 3 "International system of sea ice symbols" (coding tables and symbols for ice charts)
  • From 2007 WMO No.259 is formally managed in electronic form
  • 193 terms and definitions in 13 sections supporting sea ice observations at a point”, “ice analysis (ice charting)” and sea ice climatology [in part of operations]
WMO Sea Ice Nomenclature in electronic form


TERMINOLOGY - Volume I

By subject
In alphabetical order
Equivalents in 4 languages
First language:
Second language:
Arrange type:
Results: [html] 0 terms(s)
Query

ILLUSTRATED GLOSSARY - Volume II

Photos by subject
Photos in alphabetical order
First language:
Second language:
Arrange type:
Results: [html] 0 terms(s)
Query

WMO SEA-ICE NOMENCLATURE

TERMINOLOGY
Linguistic equivalents

<table>
<thead>
<tr>
<th>Item No.</th>
<th>English</th>
<th>French</th>
<th>Russian</th>
<th>Spanish</th>
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<tbody>
<tr>
<td>1</td>
<td>Floating ice</td>
<td>Glace flottante</td>
<td>Ледяная льдина</td>
<td>Hielo flotante</td>
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<td>1.1</td>
<td>Sea ice</td>
<td>Glace de mer</td>
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<td>Hielo marino</td>
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<td>Glace de mer</td>
<td>Ледяная льдина</td>
<td>Hielo fijo</td>
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</tbody>
</table>

Legend:
- 1: Incomplete
- 1.1: Complete

Notes:
- The concept includes ice that is stranded or grounded.
- The concept includes ice that has originated from the freezing of sea water.
- The concept includes ice that has originated from the freezing of sea water.

Instructions:
- The concept includes ice that is stranded or grounded.
- The concept includes ice that has originated from the freezing of sea water.

Queries:
- By subject
- In alphabetical order
- Equivalents in 4 languages
- First language:
- Second language:
- Results: [html] 0 terms(s)
- Query
Procedures for sea ice standards management

Sea ice information transport standards

- "SIGRID-3: a vector archive format for sea ice charts" (WMO/TD-No. 1214, revision 2 Mar 2010) is the main transport format for ice charts at a level of ice services.
  - geometry based on shapefile format
  - thematic content and coding compliant with WMO No.259
  - supports all types of sea ice objects: polygones (areas), lines and points

- Ice Object Catalogue (version 4.1 - Mar 2007, version 5.0.1 - Mar 2010 & 5.1 - Feb 2012) is a standard sea ice content for ENC.
  - thematic content and coding compliant with WMO No.259

- WMO GRiB and NetCDF are used to support sea ice input/export for numerical models
National Ice Services worldwide

**Northern hemisphere**
- **Arctic Ocean**: Russia, USA
- **Canadian Arctic**: Canada
- **Eurasian Arctic, Bering and White Seas**: Russia
- **North Atlantic and Barents Sea**: Norway
- **North Pacific, Bering, Beaufort and Chukcha Seas**: USA
- **Greenland Sea, Davis Strait, Baffin Bay**: Denmark, Canada
- **Iceland Sea**: Iceland
- **Baltic Sea** (BSIS: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Netherlands, Norway, Poland, Russia, Sweden)
- **Far East Seas**: China, Japan, Russia, USA
- **Caspian Sea**: Russia
- **Great Lakes**: NAIS (NAIS: Canada/USA)

**Southern Hemisphere**
- **Hemispheric analysis**: USA, Russia
- **Regional analysis**: USA, Norway
- **Sectoral analysis**: Argentina, Australia, Russia

Source: WMO Publication No. 574 “Sea Ice Information Services in the World”, edition 2010
Why the ice charts?
## Checkpoints for ice analysis worldwide

<table>
<thead>
<tr>
<th>Year</th>
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<th>Antarctic</th>
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<tbody>
<tr>
<td>1880</td>
<td>DMI: ice edge, Greenland waters</td>
<td>...</td>
</tr>
<tr>
<td>1900</td>
<td>Met.no: ice edge, N Atlantic</td>
<td>...</td>
</tr>
<tr>
<td>1920</td>
<td>AARI: ice extent, NSR</td>
<td>...</td>
</tr>
<tr>
<td>1940</td>
<td>CIS: 1933: ice charts, NSR</td>
<td>...</td>
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<tr>
<td>1960</td>
<td>NIC: 1959: ice charts, Canadian Arctic</td>
<td>...</td>
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<tr>
<td>1980</td>
<td>NIC: 1972: ice charts, NH</td>
<td>...</td>
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<td>2000</td>
<td></td>
<td>...</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td>...</td>
</tr>
</tbody>
</table>

### Ice Charts
- DMI: ice charts, Greenland waters
- Met.no: ice charts, N Atlantic
- AARI: 1933: ice charts, NSR
- CIS: 1959: ice charts, Canadian Arctic
- NIC: 1972: ice charts, NH
- BSIM: ice in Baltic code
- AARI: 1956: reg
- NIC: 1971: ice charts, sectoral
- NIC: 1973: ice charts, SH

### Ice Analysis Systems
- EMSR-SSMR-SSM/I
- EMSR: 1978: SSMR-SSM/I
The IPY Ice Logistics Portal is a joint initiative of JCOMM-ETSI and Polar View, aimed at creating a convenient point of access to operational sea ice information produced by the world’s ice services. Access to products is provided via a series of pre-defined regions for both the Arctic and the Antarctic. Since the primary focus of the IPY Ice Logistics Portal is on operational sea ice data (i.e., ice charts), only the most recent information is displayed for any given region.

For BAS Envisat SAR data in the Antarctic go to www.polarview.aq
Sea ice information in WIS: SIGRID-3 is very friendly for WIS