NEW ZEALAND METEOROLOGICAL SERVICE

TECHNICAL INFORMATION CIRCULAR NO. 93.

INTERNATIONAL ICE NOMENCLATURE

The following is the English text of the International Sea Ice Nomenclature adopted by the World Meteorological Organization on the recommendation of the Commission for Maritime Meteorology, 1955:

Abridged International Ice Nomenclature

Ice found at sea may be of three different origins. It may be formed at sea (Sea Ice), on land (Ice of Land Origin) or on rivers and lakes (River-ice and Lake-ice). The present nomenclature gives terms and definitions of ice of the first two mentioned categories only. In the case of river-ice and lake-ice the appropriate sea-ice terms may be used, e.g. "floes of river-ice".

Below is given :

1. A summary of the ice terms included in the nomenclature, grouped together under headings which will guide the reader as to which terms are available for describing kindred forms of ice;

2. Definitions of the ice terms arranged in alphabetical order.

Where double terms are used e.g. Pack-ice/Drift-ice, either of the two terms may be used.

SUMMARY OF ICE TERMS

1. S E A I C E

1.1 Development

1.11. New ice.
- 1.111. Ice crystals/Frazil crystals.
- 1.112. Slush or Sludge.
  - 1.1121. Ice slush.
  - 1.1122. Snow slush.
  - 1.1123. Sludge.
- 1.113. Pancake ice.
- 1.114. Ice rind.

1.12. Young ice.

1.13. Winter-ice.
- 1.131. Medium Winter-ice.
- 1.132. Thick Winter-ice.

1.14. Polar ice.
- 1.141. Young Polar ice.
- 1.142. Arctic Pack.

1.15. Bay-ice (cf. 1.213.).

1.16. Ice-shelf (cf. 2.3.).
- 1.161. Ice island (cf. 2.31.).

1.2 Forms of Fast-ice.

1.21. Fast-ice.
- 1.211. Shore ice.
  - 1.2111. Young shore ice.
- 1.212. Winter fast-ice.
- 1.213. Bay-ice (cf. 1.15).
- 1.214. Polar fast-ice.

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1.22. Icefoot.
1.23. Anchor ice/Ground ice.
1.24. Grounded hummock.

1.3 Pack-ice/Drift-ice.

1.31. Closeness.
1.311. Very close pack-ice/drift-ice.
1.312. Close pack-ice/drift-ice.
1.313. Open pack-ice/drift-ice.
1.314. Very open pack-ice/drift-ice.
1.32. Size of floes.
1.321. Ice-floe/Floe.
1.3211. Vast ice-floe.
1.3212. Big ice-floe.
1.3213. Medium ice-floe.
1.3214. Small ice-floe.
1.322. Ice-cake.
1.3221. Small ice-cake.
1.323. Bergy-bit (Floeberg[x]) (cf. 2.5.).
1.324. Growler (cf. 2.6.).
1.325. Brash-ice (cf. 1.65 & 2.7.).
1.33. Arrangement.
1.331. Ice-field/Field of ice.
1.3311. Large ice-field/field of ice.
1.3312. Medium ice-field/field of ice.
1.3313. Small ice-field/field of ice.
1.332. Belt.
1.333. Patch.
1.334. Bay/Bight.
1.335. Tongue.
1.336. Stream/Strip/String.
1.337. Ice-edge.
1.3371. Ice-bar.
1.3372. Open ice-edge.
1.338. Ice limit.

1.4 Construction and Surface Features.

1.41. Level ice.
1.42. Pressure-ice/Screw-ice.
1.421. Rafted ice.
1.422. Hummocked ice.
1.423. Pressure ridge.
1.424. Hummock.
1.425. Standing floe.
1.43. Ice breccia/Ice mosaic.
1.44. Weathered ice.
1.45. Ram.
1.46. Bare ice.
1.47. Snow-covered ice.

1.5 Openings in the ice.

1.51. Crack.
1.511. Tide crack.
1.52. Lead/Lane.
1.521. Shore Lead.
1.53. Polynya.
1.531. Shore Polynya.
1.532. Polynya off edge of shore ice.
1.54. Pool.
1.55. Open Water.

1.6 Stages of melting.

1.61. Snow water on the ice/Puddle.
1.62. Thawing holes in the ice.

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x) To be used only when the sea-ice origin is not in doubt.

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1.63. Dried ice.
1.64. Rotten ice.
1.65. Brash-ice (cf. 1.325. & 2.7.).

2. ICE OF LAND ORIGIN FOUND AT SEA

2.1 Firn-snow/Névé.

2.2 Glacier-ice.
2.21. Glacier Tongue.

2.3 Ice-shelf (cf. 1.16.).
2.31. Ice island (cf. 1.161.).

2.4 Iceberg.
2.41. Tabular berg/Barrier berg.
2.42. Glacier berg.

2.5 Bergy-bit (cf. 1.323.).

2.6 Growler (cf. 1.324.).

2.7 Brash-ice (cf. 1.325. & 1.65.).

3. SKY AND AIR INDICATIONS

3.1 Water-sky.

3.2 Ice-blink.

3.3 Frost smoke.

Definitions of ice terms

Anchor ice/Ground ice. Ice found attached or anchored to the bottom, irrespective of nature of its formation.

Arctic pack. Almost salt-free ice, having existed over two years. Thickness up from 2.5 m. The ice surface is undulating. Its hummocks having melted more than once are therefore smoothed. In case of absence or insignificant thickness of snow cover, this ice is coloured in different tints of blue.

Bare ice. Ice without snow cover.

Barrier berg. See Tabular berg.

Bay/Bight. An inward bend of the ice-edge, formed either by wind or current.

Bay-ice. Level ice of more than one winter's growth, which has remained unhummocked and also becomes nourished by surface layers of snow. Thickness of ice and snow up to about 2 m. above sea level.

Belt. Long area of pack-ice/drift-ice from a few kilometres to more than 100 kilometres in width.

Bergy-bit. A medium-sized piece of ice, generally less than 5 m. above sea level and about the size of a small cottage, mainly originating from glacier-ice, but occasionally a massive piece of sea-ice or disrupted hummocked ice. When the sea-ice origin is not in doubt the term Floeberg may be used.

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Big ice-floe. See Ice-floe.

Bight. See Bay.

Brash-ice. Accumulation of small fragments not more than 2 m. across, the wreckage of other forms of ice.

Close pack-ice/Drift-ice. Composed of floes mostly in contact. Ice cover 7/10 - 9/10 or 6/8 - 7/8.

Crack. Any fracture or rift in sea-ice not sufficiently wide to be described as a lead/lane. It is usually possible to jump across a crack.

Dried ice. Ice surface, from which the water has disappeared after the formation of cracks and holes. During the period of drying, the surface is whitening.

Fast-ice. Sea-ice which remains fast, generally in the position where originally formed, and which may attain a considerable thickness. It is found along coasts, where it is attached to the shore, or over shoals, where it may be held in position by islands, grounded icebergs or grounded polar ice.

Firn snow/Névé. Snow which has become coarse-grained and compact through temperature changes, forming the transition stage to glacier-ice.

Floe. See Ice-floe.

Floe-berg. See Bergy-bit.

Frazil crystals. See Ice crystals.

Frost smoke. Fog-like clouds, due to the contact of cold air with relatively warm sea water, which appear over newly-formed leads/lanes and pools, or leeward of the ice-edge, and which may persist while slush or sludge and young ice are forming.

Glacier berg. Mass of glacier-ice which has broken away from its parent formation on the coast, and either floats, generally at least 5 m. above sea level, or is stranded on a shoal.

Glacier-ice. Any ice floating on the sea as a berg, which originates from a land glacier.

Glacier tongue. Projecting seaward extension of glacier, usually afloat. In the Antarctic the extension may sometimes be as much as 10 km.

Grounded hummock. Hummocked grounded ice formation. There are single grounded hummocks and lines (or chains) of grounded hummocks.

Ground ice. See Anchor ice/Ground ice.

Growler. Smaller piece of ice than a bergy-bit, frequently appearing greenish in colour and barely showing above water. May originate both from sea-ice and from glacier-ice.

Hummock. Ice pieces piled one over another on a rather smooth ice surface.

Hummocked ice. Ice piled haphazardly one piece over another.

Ice-bar. Ice-edge consisting of floes compacted by wind, sea and swell, and difficult to penetrate.

Iceberg. Large mass of floating or stranded ice, more than 5 m. above sea level, which has broken away either from a glacier or from

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an ice-shelf formation. Subdivisions are Glacier berg and Tabular berg/Barrier berg.

Ice-blink. A typical whitish glare on low clouds above an accumulation of distant ice. It is especially glowing when observed on the horizon.

Ice breccia/Ice mosaic. Ice pieces of different age frozen together.

Ice-cake. A floe smaller than 10 m. across. One less than 2 m. across may be termed a small cake. (See Brash-ice).

Ice crystals/Frazil crystals. Fine spicules or plates of ice, suspended in water.

Ice-edge. The boundary at any given time between the open sea and sea-ice of any kind, whether floating or fast.

Ice-field/Field of ice. Area of pack-ice/drift-ice, consisting of any size of floes, of such extent that its limits cannot be seen from the crow's nest.

Ice-floe/Floe. A single piece of sea-ice, other than fast-ice, large or small, described if possible as "Light" or "Heavy" according to thickness.

Vast	-	over 10 km. across
Big	-	1 - 10 km. across
Medium	-	200 - 1000 m. across
Small	-	10 - 200 m. across.

Icefoot. Ice step attached to the coast, unmoved by tides and remaining after the fast-ice has moved away. Several varieties of icefoot can be distinguished.

Ice island. Drifting portion which has separated off from an ice-shelf.

Ice limit. Average position of the ice-edge in any given month or period based on observations over a number of years.

Ice mosaic. See Ice breccia/Ice mosaic.

Ice-rind. A thin, elastic, shining crust of ice, formed by the freezing of slush or sludge on a quiet sea surface. Thickness less than 5 cm. It is easily broken by wind or swell, and makes a tinkling noise when passed through by a ship.

Ice-shelf. Ice formation over 2 m. above sea level with level surface, which originates from annual accumulations of firn-snow/névé layers on bay-ice (or on the seaward extension of a glacier.)

Ice-slush. An accumulation on the surface of the water of ice needles frozen together; it forms patches or a thin compact layer of a greyish or leaden-tinted colour. The surface of the sea covered with ice-slush has a dim tint.

Lane. See Lead.

Large ice-field/field of ice. An ice-field over 20 km. across.

Lead/Lane. A navigable passage through pack-ice/drift-ice.

Level ice. Ice with a flat surface, which has never been hummocked; typical with regard to bays, gulfs, straits, archipelagoes and shallow waters, where the ice formation occurs in undisturbed conditions.

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Medium ice-field/field of ice. An ice-field 15 - 20 km. across.

Medium ice-floe. See Ice-floe.

Medium winter-ice. Winter-ice of thickness 15 - 30 cm.

Névé. See Firn-snow.

New ice. A general term which includes Ice crystals/Frazil crystals, Slush, Sludge, Pancake ice and Ice-rind.

Open ice-edge. Unsteady and not sharply outlined ice-edge, limiting an area of open ice; in most cases it is to leeward.

Open pack-ice/Drift-ice. Floes seldom in contact with many leads and pools. Ice cover 4/10 - 6/10 or 3/8 - 5/8.

Open water. A relatively large area of free navigable water in an ice-encumbered sea.

Pack-ice/Drift-ice. Term used in a wide sense to include any area of sea-ice, other than fast-ice, no matter what form it takes or how disposed.

Pancake ice. Pieces of newly-formed ice, usually approximately circular, about 30 cm. to 3 m. across, and with raised rims, due to the pieces striking against eachother, as the result of wind and swell.

Patch. A collection of pack-ice/drift-ice, less than 10 km. across, the limits of which are visible from the crow's nest.

Polar fast-ice. Fast-ice formed by the grounding and cementing together of polar ice. By the end of the winter it may reach some ten kilometres from the coast.

Polar ice. Extremely heavy sea-ice, up to 3 m. or more in thickness of more than one winter's growth. Heavily hummocked and may ultimately be reduced by weathering to a more or less even surface. Polar ice may be subdivided into Young polar ice and Arctic pack.

Polynya. Water area enclosed in ice, generally fast; this water area remains constant and has usually an oblong form. Sometimes the "polynya" is limited on one side by the coast.

Polynya off edge of shore ice. Polynya between shore ice and drift-ice, formed by squeezing winds and currents.

Pool. Any enclosed relatively small sea area in pack-ice/drift-ice other than a lead/lane.

Pressure-ice/Screw-ice. A general term for ice which has been squeezed together and in places forced upwards. Subdivisions are Rafted ice, Hummocked ice, and Pressure ridge.

Pressure ridge. Ridge or wall of hummocked ice where floes have been pressed against each other.

Puddle. See Snow water on the ice/Puddle.

Rafted ice. Type of pressure-ice/screw-ice formed by one floe over-riding another.

Ram. Air underwater ice projection from an iceberg or a hummocked ice-floe. Its formation is usually due to a more intensive melting of the unsubmerged part of the floe.

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Rotten ice. Ice which has become honeycombed in the course of melting and which is in an advanced state of disintegration.

Screw-ice. See Pressure-ice.

Shore ice. Basic form of fast-ice, representing a compact ice cover attached to the shore and, in shallow waters, also grounded; during changes of sea level vertical fluctuations can be observed. Shore ice can spread in breadth up to several hundreds of kilometres.

Shore lead. A lead between pack-ice/drift-ice and the shore, or between pack-ice/drift-ice and a narrow fringe of fast-ice.

Shore polynya. Polynya along the coast, formed either by current or wind.

Sludge. Spongy whitish ice lumps, a few centimetres across; they are formed of slush, of snow slush and sometimes of spongy ice lumps formed on the bottom of the sea and emerging on the surface.

Slush or sludge. An accumulation of ice crystals which remain separate or only slightly frozen together. It forms a thin layer and gives the sea surface a greyish or leaden-tinted colour. With light winds no ripples appear.

Small ice-cake. An ice-cake less than 2 m. across.

Small ice-field/field of ice. An ice-field 10 - 15 km. across.

Small ice-floe. See Ice-floe.

Snow-covered ice. Ice covered with snow.

Snow slush. Viscous mass formed as a result of a thick snow fall into cooled water.

Snow water on the ice/Puddle. Ice the surface of which is covered with snow water i.e. an accumulation on the ice of melt-water, mainly due to snow melting. The stages of development of snow water are as follows : patches of melting snow, puddles on the ice - small and shallow accumulations of melt-water on the ice, larger amounts of water, which have deepened on account of ice melting and which have sharply-defined outlines.

Standing floe. A separate floe standing vertically or inclined and enclosed by rather smooth ice.

Stream/Strip/String. Long narrow area of pack-ice/drift-ice, about 1 km. or less in width, usually composed of small fragments detached from the main mass of ice, and run together under the influence of wind, swell, or current.

String. See Stream.

Strip. See Stream.

Tabular berg/Barrier berg. A flat-topped berg, showing horizontal firn-snow/névé layers, usually broken off from an ice-shelf formation.

Thawing holes in the ice. Ice with open holes in it, usually of a circular form; these holes are a further stage of development of snow waters by ice melting.

Thick winter-ice. Winter-ice more than 30 cm. thick.

Tide crack. Crack formed between shore ice and the icefoot under the action of the fluctuations of the sea level. Typical only for shore ice areas.

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Tongue. A projection of the ice-edge up to several kilometres in length, caused by wind or current.

Vast ice-floe. See Ice-floe.

Very close pack-ice/Drift-ice. Ice cover practically 10/10 or 8/8 and little if any water present.

Very open pack-ice/Drift-ice. Water preponderates over ice. Ice cover 1/10 - 3/10 or 1/8 - 2/8. (Formerly known in Britain as "drift-ice").

Water-sky. Typical dark patches and strips on low clouds over a water area enclosed in ice or behind its edge. It is due sometimes to an open water area out of the limits of visibility.

Weathered ice. Hummocked polar ice subjected to weathering which has given the hummocks and pressure ridges a rounded form. If the weathering continues, the surface may become more or less even.

Winter fast-ice. Fast-ice in fjords, gulfs and straits, mainly formed by growth from the shore, but also by cementing of pack-ice/drift-ice. Winter fast-ice rises and falls according to the tide.

Winter-ice. More or less unbroken level ice of not more than one winter's growth, originating from young ice. Thickness from 15 cm. to 2 m. Completely safe for travelling purposes. Winter-ice may be subdivided into Medium winter-ice and Thick winter-ice.

Young ice. Newly-formed level ice generally in the transition stage of development from ice-rind, or pancake ice to winter-ice; thickness from 5 cm. to 15 cm., as a rule impassable and unsafe for travel either by men or dogs, or in the case of aircraft for ski or wheel landings.

Young polar ice. Polar ice which has not melted during the first summer of its existence and which has passed over to the second phase of increase. At the end of the second winter, it attains a thickness up to 2 m. and more. It differs from ice one year old by a greater portion showing above the surface of the water and also by the hummocks on it being smoother.

Young shore ice. Primary stage of formation of shore ice; it is of local formation (at shore) and usually consists of ice-rind or thin young ice; usually some 10 metres in width, but sometimes even more (100 - 200 m.).

Issued by:-

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P.O. Box 722,
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4 April 1956.

NEW ZEALAND METEOROLOGICAL SERVICE

Amendment to Technical Information Circular No.93.

International Ice Nomenclature

The Secretariat of the World Meteorological Organisation has notified the following amendments to the English text of the Abridged International Ice Nomenclature, a copy of which was circulated as N.Z. Met.S. Technical Information Circular No. 93:

Section 3. Sky and Air Indications: Definitions of ice terms

Glacier tongue should read "Projecting seaward extension of glacier, usually afloat. In the Antarctic glacier tongues may extend over many tens of kilometres."

Polar fast-ice should read "Fast-ice formed by the grounding and cementing together of polar ice. By the end of the winter it may reach some tens of kilometres from the coast."

Ram should read "An underwater ice projection ... ...".

Issued by:

The Director,
N.Z. Meteorological Service,
P.O. Box 722,
WELLINGTON.

15th October, 1956.