

## PART 5

### Environment Canada's Marine and Ice Warning and Forecast Programs

#### Background

→Environment Canada's Meteorological Service of Canada (MSC) is the agency responsible for delivering Canada's weather service. The MSC offers a broad range of products and services that are designed to help mariners make informed decisions on how weather will affect them. The Canadian Coast Guard (CCG) plays an important role in disseminating forecasts and warnings and in collecting and relaying weather information from volunteer observers and ships.

→The constant stream of data coming from volunteer observers, ships, weather buoys, automatic coastal stations, and lighthouses is supplemented by satellite imagery, weather radar and a full set of numerical weather products adapted for marine operations.

#### Marine Warning Program

Warnings of extreme weather events that pose a threat to life and property at sea such as strong winds, freezing spray, high coastal waters, squall lines and other localized phenomena shall be issued for the offshore economic zone including the St. Lawrence Seaway and major inland waters.

→Major inland waters are defined as having significant marine activity and where time to reach shore is comparable to the marine weather warning lead time. The criteria for issuing weather warnings is based on national guidelines, but determined regionally to account for regional climatology and the nature of the regional marine community. The following table describes the warning program:

**Table 1: Synoptic warnings**

Synoptic warnings *	Warning criteria
Strong wind warning <sup>(2)</sup>	Winds <sup>(1)</sup> 20 to 33 knots inclusive occurring or expected to occur in any portion of a marine area including any portion defined by a local effect or an «except» statement.
Gale warning	Winds <sup>(1)</sup> 34 to 47 knots inclusive occurring or expected to occur in any portion of a marine area including any portion defined by a local effect or an «except» statement.
Storm warning	Winds <sup>(1)</sup> 48 to 63 knots inclusive occurring or expected to occur in any portion of a marine area including any portion defined by a local effect or an «except» statement.
Hurricane force wind warning	Winds <sup>(1)</sup> 64 knots or above occurring or expected to occur in any portion of a marine area including any portion defined by a local effect or an «except» statement.
Freezing spray warning	Ice accretion rate of 0.7 cm/hr or more occurring or expected to occur in any portion of a marine area including any portion defined by a local effect or an «except» statement.

#### Notes:

\* These warnings are included in the body of the text forecast.

<sup>(1)</sup> Gusts are excluded from the definition.

<sup>(2)</sup> A warning is not required when the wind is described using the range 15-20 knots. This range is normally used for greater accuracy.

**Range:** With the exception of Note (2) above, when a range is used to describe the wind speed, the upper value of the range determines the warning category.

**Table 2: Localized warnings**

Localized warnings/watches *	Warning criteria
Squall watch	Advance notice of conditions that are favourable to the development of squalls.
Squall warning	Wind gust $\geq$ 34 knots associated with a line or an organized area of thunderstorms.
Tornado watch	Advance notice of conditions that are favourable to the development of Tornados.
Tornado warning	Evidence of tornado formation (radar, report from a reliable source, etc.) over a marine area, or an existing tornado moving from land to an adjacent marine area.
Waterspout watch	Advance notice of conditions that are favourable to the development of cold-air waterspouts.
→ Waterspout warning	Evidence of waterspout formation (radar, report from a reliable source, etc.) over a marine area.
→ High water level warning	To warn mariners and coastal populations of potentially hazardous impacts due to abnormally high water levels or waves along coastline areas.
Special marine warning/watch	Used to describe conditions other than those defined above that may have potentially hazardous impacts on navigation.

**Notes:** \* These warnings/watches are delivered using separate messages.

**Ice warnings:** refer to the Canadian Ice Service further down in this chapter.

**→ Marine and Ice Forecast program**

→ Marine forecasts are issued for the offshore economic zone including the St. Lawrence Seaway and major inland waters. For sea ice, ice forecasts are issued for offshore marine areas as well as the Great Lakes. The production schedule is detailed in each regional section of this chapter. The forecast program includes the following bulletins:

**Table 3: Marine forecast program**

Forecast or bulletin name	Details
Technical marine synopsis	Provides the positions and trends of the main weather systems for the forecast period covering Days 1 and 2.
Marine forecast (or Regular marine forecast)	Provides information on: synoptic warnings, wind, visibility, precipitation, and freezing spray. It may include air temperature as appropriate. Valid for Days 1 and 2.
Recreational boating marine forecast	→ Tailored to the needs of recreational boaters, it is available on a seasonal basis and only in specific regions.
Marine weather statement	Issued when deemed necessary, it provides additional information on potentially high impact marine conditions.
Wave height forecast	Provides information on significant wave heights valid for Days 1 and 2. It is not available for the Arctic waters or Hudson Bay.
Extended marine forecast	Primarily used as a planning tool, it provides an extended marine wind outlook for Days 3, 4, and 5.
Iceberg bulletin	→ Provides information on distribution of icebergs valid for the time of issue of the bulletin.
→ Ice forecasts	Provides information on hazardous ice conditions valid for Days 1 and 2.
NAVTEX <sup>(1)</sup>	→ International Maritime Organization (IMO)-compliant NAVigational TeLEX bulletin issued with each regular marine forecast or ice forecasts in a standardized abbreviated format - see Table 5 for Abbreviations.
MAFOR <sup>(1)</sup>	This is a specialized coded marine forecast produced for Quebec and Ontario.

<sup>(1)</sup> More details on NAVTEX and MAFOR are provided after this section.

## **Monitoring the Forecast**

Forecasts are monitored, and amended as necessary, to reflect unexpected or changing weather conditions according to criteria based on the following principles:

1. when safety or security is at risk;
2. when inconvenience to the marine community will be extensive or;
3. when the product could adversely affect the credibility of the marine forecast program.

### **→Marine and Ice Forecast Areas**

→Marine forecasts and ice forecasts are issued for marine and ice areas as outlined in the regional maps. The sizes and boundaries of these areas are determined regionally based on the following considerations:

1. marine traffic density,
2. the ability to forecast to the proposed resolution,
3. the degree to which, climatologically, marine weather varies, and
4. the ability to distribute the information effectively to the marine community.

## **Current Conditions**

→Current weather data is available to Canadians for their local area. The frequency and quality of the data will be consistent with the standards established by the World Meteorological Organization (WMO). The data may include as appropriate:

- wind speed and direction,
- atmospheric pressure,
- sky conditions,
- precipitation type,
- restrictions to visibility,
- wave height,
- current temperature.

General information on current sea-ice will be provided to the marine community once a week to provide an adequate planning tool for those considering entering ice encumbered waters.

## **Emergency Response**

Meteorological support is provided during emergencies and includes the provision of meteorological information and forecasts. In the case of a pollution event, Environment Canada adheres to the “polluter pay” policy for the provision of all services. Where agreements are in place, Environment Canada will make its distribution systems available to transmit vital information during emergency situations.

## **Delivery of Marine Warning and Forecast Services**

Delivery of marine warning and forecast services to Canadians is primarily by mass communication in order to reach the greatest population base through technology available to most Canadians. The following principles apply, regardless of the specific available technologies:

- a. Internet access via the World-Wide WEB. All forecast and warning information will be found at the following address: [http://www.weatheroffice.gc.ca/canada\\_e.html](http://www.weatheroffice.gc.ca/canada_e.html);
- b. Basic services to Canadians shall be delivered primarily by mass distribution in partnership with media, relying on current and developing technologies in radio, television, newspaper, and the Internet. These distribution mechanisms represent the primary methods by which most Canadians receive their weather information, now and in the future;

- c. Marine and Environmental Advisories, Watches and Warnings are distributed through various mechanisms including partnerships with national and regional media distributors and local emergency measures organizations.

### **The Voluntary Observing Ship (VOS) Program**

→The VOS program is organized for the purpose of obtaining weather and ice, and oceanographic observations from moving ships. An international program under the auspices of the WMO, the VOS has nearly 8,000 vessels participating from 60 nations. It is part of the WMO Global Observing System of the World Weather Watch. Canada has near 235 vessels participating. It closely follows WMO guidelines for VOS programs.

→The Canadian program is supported by full-time Port Meteorological Officers (PMO). The national program office in Toronto manages the program and oversees PMO activities. The office also maintains a VOS Program Computerized Data Management System to record PMO ship visits, vessel mailing addresses, vessel equipment inventories and other information about vessel reports. Any vessel willing to take and transmit observations in marine areas where Environment Canada prepares weather forecasts (see the regional annexes) can join the program. The importance of ship reports cannot be overstated. Without your participation in VOS, there would be vast marine areas without data, making marine forecasting nearly impossible for these areas. We thank ships' officers and crew for their fine work, dedication, and commitment.

→Mariners are also encouraged to inquire about the SEAS (Shipboard Environmental data Acquisition System) program with their regional PMO. Under the SEAS program, observations are sent via INMARSAT C and the cost of transmission is absorbed by a consortium of countries interested in timely marine observations on a global scale.

The WMO establishes the ships synoptic code, and procedures and standards for the collection and dissemination of information worldwide. The WMO also maintains information about countries and vessels participating in the program.

### **Buoys program**

In order to complement the observational network, Environment Canada operates a network of buoys across the country. This data becomes part of the collection of weather reports sent to the distribution network and is used to improve marine forecasting. The location, WMO identifiers and names of the Environment Canada buoys are given in the regional annexes.

Mariners are requested to use caution when approaching buoys as mooring chains are normally not detectable from a ship and can be damaged or even severed if there is contact. Such a mishap could possibly result in the buoy becoming adrift thus requiring a costly effort to recover the platform. Please keep the Regional PMO's informed of any incidents involving buoys.

**Buoy Locations:** buoy positions are described in each specific regional annex.

### **Port Meteorological Officers (PMOs)**

→PMOs spend most of their time visiting ships in support of the VOS program. This is to encourage vessels to report weather and ice conditions, to instruct observers about procedures and the use of code; to supply observing forms, handbooks (free of charge!); to calibrate equipment; and, in some cases, to install, on loan, meteorological or oceanographic instrumentation. The PMO is also responsible for recruiting new vessels wishing to participate in the VOS program.

→If a PMO visits your ship, feel free to ask questions about observing and coding, and reporting weather and ice conditions. Inform the PMO of any concerns you may have with forecasts, warnings, or facsimile products, especially if you have specific problems. The PMO will contact the appropriate party for investigation. Keep the PMO informed of your contact information.

→Table 4: Port meteorological officers (PMOs)

Great Lakes	Atlantic - Maritimes	→Atlantic - Newfoundland
<p>Tony Hilton, Supervisor  Roland Kleer, PMO  Shawn Livingstone, PMO  Environment Canada, MSC  100 East Port Boulevard  HAMILTON, ON L8H 7S4  Telephone: 905-312-0900  Facsimile: 905-312-0730  E-Mail: <a href="mailto:anthony.hilton@ec.gc.ca">anthony.hilton@ec.gc.ca</a></p>	<p>Randy Sheppard, Supervisor  Derek Cain, PMO  Environment Canada, MSC  45 Alderney Drive, 16<sup>th</sup> floor  DARTMOUTH, NS B2Y 2N6  Telephone: 902-426-6616  Cellular: 902-456-6927  Facsimile: 902-426-6404  E-Mail: <a href="mailto:randy.sheppard@ec.gc.ca">randy.sheppard@ec.gc.ca</a></p>	<p>Andre Dwyer, PMO  Environment Canada, MSC  6 Bruce Street.  MOUNT PEARL, NL A1N 4T3  →Telephone: 709-772-4798  Cellular: 709-689-5787  Facsimile: 709-772-5097  E-Mail: <a href="mailto:andre.dwyer@ec.gc.ca">andre.dwyer@ec.gc.ca</a></p>
St-Lawrence - Québec	→Pacific	→Great Slave Lake / Lake Athabaska /Western Arctic
<p>Erich Gola, PMO  Environment Canada, SMC Canada  Place Bonaventure, Portail Nord-Est  800 de la Gauchetière ouest, Suite 810  MONTREAL, QC H5A 1L9  Telephone: 514-283-1644  Facsimile: 514-496-1867  E-Mail: <a href="mailto:erich.gola@ec.gc.ca">erich.gola@ec.gc.ca</a></p>	<p>Bruce Lohnes, Supervisor  Vaughn Williams, Supervisor  Bijan Rasti, PMO  Alan Webster, PMO  Environment Canada, MSC  140 13160 Vanier Place  RICHMOND, BC V6V 2J2  Telephone: 604-664-9188  Facsimile: 604-664-4094  E-Mail: <a href="mailto:bruce.lohnes@ec.gc.ca">bruce.lohnes@ec.gc.ca</a>  E-Mail: <a href="mailto:vaughn.williams@ec.gc.ca">vaughn.williams@ec.gc.ca</a></p>	<p>Ben Lemon, PMO  Environment Canada, MSC  M.J. Greenwood Centre  9345 - 49 Street  EDMONTON, AB T6B 2L8  Telephone: 780-495-6442  E-Mail: <a href="mailto:ben.lemon@ec.gc.ca">ben.lemon@ec.gc.ca</a></p>
→Manitoba Lakes		
<p>Barry Funk, PMO  Monitoring and Systems  Environment Canada, MSC  Suite 150  123 Main Street  WINNIPEG, MB R3C 4W2  Telephone: 204-984-2018  E-Mail: <a href="mailto:barry.funk@ec.gc.ca">barry.funk@ec.gc.ca</a></p>		

## NAVTEX

→MSC will provide CCG with marine forecast information in NAVTEX format for coastal and offshore areas of responsibility based on IMO standards. Marine forecast information provided will include:

MSC will provide CCG with:

- I. **Warnings** (Winds & ice accretion);
- II. **Synopsis** (major features);
- III. **Forecasts** (wind, visibility, ice accretion, wave height).

→Each bulletin will contain a WMO telecommunication header, a valid period, notes on parameters used within the bulletin, a synopsis section, a weather forecast section and a wave forecast section. Below is a sample of a partial NAVTEX produced for CCG MCTS Sydney. Note that NAVTEX will make use of abbreviations: this is necessary in order to comply with the physical limitations of the NAVTEX system. In the example, text in superscript indicates how abbreviations are used.

NAVTEX service sample (518 kHz)	
Header	FQCN <sup>34</sup> CWHX 171400
Title(part one)	▶ NAVTEX/I FOR SYDNEY VCO AT 10:00 AM AST FRI <sup>Friday</sup> 17 NOV <sup>November</sup> 2006.
<b>Weather forecast</b>	
Parameters	▶ VLD <sup>valid period</sup> 17/14Z-19/03Z, WND(KT) <sup>wind in knots</sup> , VIS(NM) <sup>visibility in nautical miles</sup> ABV <sup>above</sup> 1 NM UNL IND <sup>unless indicated</sup> , FOG IMPLIES VIS 1 NM OR LESS.
Synopsis	▶ <b>SYNOPSIS:</b> 17/14Z STRM <sup>storm</sup> 980 MB OVR SRN NFLD <sup>over southern Newfoundland</sup> 18/14Z STRM <sup>storm</sup> 985 MB OVR NRN NFLD <sup>over northern Newfoundland</sup> 17/14Z RIDG OVR WRN QUE. <sup>ridge over western Quebec</sup> 18/14Z RIDG OVR WRN GU ST LAW. <sup>ridge over western Gulf of St Lawrence</sup>
Area name	▶ EASTERN SHORE, FOURCHU:
Warning	▶ WNG <sup>warning</sup> : NIL.
Wind forecast	▶ WND: SW <sup>southwest</sup> 10-15. 17/18Z SE <sup>southeast</sup> 15-20. 18/06Z V15. 18/12Z SW <sup>southwest</sup> 15-20. 18/18Z SW20-25. 19/00Z SW15-20.
Visibility forecast	▶ VIS: 17/13Z-19/03Z PTH-FG. <sup>fog banks</sup>  {... other marine areas }
End of weather	▶ END/
<b>Wave height forecast</b>	
Parameters	▶ WAVES(M) <sup>meter</sup> VLD 17/09Z-18/10Z.
Area name	▶ EASTERN SHORE, SABLE, EAST SCOTIAN SLOPE-N <sup>- northern half</sup> , FOURCHU, BANQUEREAU:
Height in meters	▶ 1-2.  {.... Other marine areas }
End of waves and part one	▶ END/

**NAVTEX service sample (518 kHz)**

Header ▶ Title (VCO part two) ▶ <b>Weather forecast</b> Parameters ▶  Marine areas ▶ Warning ▶ Wind ▶ Visibility ▶  End of weather ▶  <b>Wave height forecast</b> Parameters ▶  Marine areas ▶ Waves ▶  End of waves and part two ▶	FQCN <u>34 CYOX</u> 171330 NAVTEX/2 FOR SYDNEY VCO.  VLD 17/13Z-19/03Z.  →GULF-PORT AU PORT, SOUTHWEST COAST: WNG: NIL. WND: S10-15G20. 17/23Z S10-15. 18/11Z S15-20. 18/18Z SW20. VIS: 17/12Z-19/02Z FG-PTH.  <i>{... other marine areas}</i>  END/  WAVES(M) VLD 17/09Z-18/09Z.  →GULF PORT AU PORT: 1-2. 18/06Z 0-1.  <i>{... other marine areas}</i>  END/
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**Table 5: Abbreviations used by MSC within NAVTEX**

**Date/Time standards**

April	APR	June	JUN	September	SEP
August	AUG	March	MAR	Sunday	SUN
December	DEC	May	MAY	Thursday	THU
February	FEB	Monday	MON	today	TDY
Friday	FRI	November	NOV	tonight	TNGHT
January	JAN	October	OCT	Tuesday	TUE
July	JUL	Saturday	SAT	Wednesday	WED

**Marine Forecast Area dividing standards**

- eastern half	-E	- northwestern half	-NW	- southwestern half	-SW
- northeastern half	-NE	- southeastern half	-SE	- western half	-W
- northern half	-N	- southern half	-S		

**Forecast parameters**

valid	VLD	unless	UNL	millibar	MB
indicated	IND	knots	KT	nautical mile	NM
implies	IMPL	meters	M		

**Table 5: Abbreviations used by MSC within NAVTEX (continued)**

**Wind elements**

east	E	south	S	west	W
north	N	southeast	SE	light	LGT
northeast	NE	southwest	SW	with gust to	G
northwest	NW	variable	VRB	warning	WNG

**Freezing spray qualifier**

freezing spray	FRZ-SPR	risk	RSK	outside the ice edge	OUT-EDGE
moderate	MOD	severe	SEV	over open water	OVR-OW
at times	OCNL				

**Wave elements**

ice covered	ICE				
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**Weather elements**

blizzard	BZ	hail	HL	mist patches	PTH-MIST
blowing snow	BS	heavy rain	HVY-RA	rain	RA
drizzle	DZ	heavy snow	HVY-SN	rain and snow mixed	MIX-RASN
flurries	LGT-SN	heavy thunderstorm	HVY-TSTM	scattered	SCT
fog	FG	ice fog	IFG	showers	SHWRS
fog banks	PTH-FG	ice pellets	IP	snow	SN
freezing drizzle	FRZ-DZ	light snow	LGT-SN	thunderstorm	TSTM
freezing rain	FRZ-RA	mist	MST	waterspout	WTSPT

**Weather/visibility elements (qualifier)**

at times	OCNL	as low as 1 mile	NR 1	one mile or less	0-1
heavy	HVY	in precipitation	IN-PRECIIP	visibility	VIS
occasional	OCNL	near zero	NR 0		

**Trend descriptors (synopsis)**

building	BLDN	intensifying	INTSF	splitting	SPLIT
dissipating	DISS	merging	MERG	weakening	WKN
deepening	DPN	quasi-stationary	QSTNR		

**Systems descriptors (synopsis)**

cold front	C-FRONT	hurricane	HURR	ridge	RIDG
col	COL	low	LOW	storm	STRM
disturbance	DISTURB	trough	TROUGH	tropical depression	TD
flat low	FLAT LOW	Post tropical storm	POST-TS	tropical storm	TS
frontal system	FRONT	high	HIGH	warm front	W-FRONT

**Position descriptors (synopsis)**

cape	CAP	lake	LK	Pacific	PAC
coastal	CSTL	longitude	LONG	peninsula	PEN
from	FM	near	NR	river	RIV
island	IS	located on a line	ON LINE	strait	STR
latitude	LAT	over	OVR		

**Table 5: Abbreviations used by MSC within NAVTEX (continued)**

**Cardinal point descriptors (synopsis)**

central	CENTRAL	northeast-southwest	NE-SW	southeast	SE
east	E	northern	NRN	southeastern	SERN
eastern	ERN	north - south	N-S	southern	SRN
east - west	E-W	northwest	NW	southwest	SW
from	FM	northwestern	NWRN	southwestern	SWRN
north	N	northwest-southeast	NW-SE	west	W
northeast	NE	south	S	western	WRN
northeastern	NERN				

**Territorial references (synopsis)**

Alberta	ALTA	New Brunswick	NB	Ontario	ONT
British Columbia	BC	Newfoundland	NFLD	Prince Edward Island	PEI
Great lakes	GRT LKS	Newfoundland and Labrador	NL	Quebec	QUE
Gulf of St Lawrence	GU ST LAW	Nova Scotia	NS	Saskatchewan	SASK
Labrador	LAB	Northwest Territories	NWT	Yukon Territory	YT
Manitoba	MAN				

**ICE ELEMENTS**

**ice concentration**

1 tenth	1	6 tenths	6	bergy water	BW
10 tenths	10	7 tenths	7	consolidated	CONS
2 tenths	2	8 tenths	8	ice free	IF
3 tenths	3	9 plus tenths	9+	open water	OW
4 tenths	4	9 tenths	9	trace of	TR-
5 tenths	5	9 to 10 tenths (lake ice)	9-10		

**ice type**

first year ice	FYI	medium ice	MEDI	thick ice	TKI
grey ice	GI	new ice	NI	thin ice	THI
greywhite ice	GWI	old ice	OI	very thick ice	VTKI

**ice qualifier**

light	LGT	Moderate Pressure	MOD PRESS	strong	STRG
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**ice general**

conditions	CDNS	Except	EXC	possible	POSS
edge	EDGE	Ice	ICE	along the coast	ALNG CST
estimated	EST	Including	INCL		

**ice direction**

eastward	EWD	northwestward	NWWD	southwestward	SWWD
northeastward	NEWD	southeastward	SEWD	westward	WWD
northward	NWD	southward	SWD		



## PACIFIC COAST

### Marine Weather Forecast Program

The Pacific Storm Prediction Centre (PSPC) located in Vancouver, BC issues a regular marine forecast and technical synopsis 4 times daily at the same time throughout the year. The forecasts are valid out to midnight of the following day. Additional products include a 3 to 5 day marine wind outlook and a wave height forecast issued twice daily.

**Table 6: Production schedule**

#### a) Text format:

Forecast name	Issue Time	Time Zone	Marine region
Technical marine synopsis	04:00, 10:30, 16:00, 21:30	PDT / PST	Pacific waters
Marine forecast.	04:00, 10:30, 16:00, 21:30	PDT / PST	Pacific waters
Marine weather statement	as needed		Pacific waters
Wave height forecast	02:00, 14:00	PDT / PST	Pacific waters
Extended marine forecast	04:00, 16:00	PDT / PST	Pacific waters

#### b) NAVTEX format on 518 kHz:

MCTS Centres	Name	Header	Availability
Tofino VAE	Navtex	FQCN33 CWVR	0200, 04:00, 10:30, 14:00, 16:00, 21:30 PDT/PST
Prince Rupert VAJ	Navtex	FQCN35 CWVR	0200, 04:00, 10:30, 14:00, 16:00, 21:30 PDT/PST

**Marine Weather Warnings: (refer to Table 1, page 5-1).**

Note the following regional particularities:

	Warning Types	Comments
<b>1</b>	<b>Strong wind warning</b>	Issued only from Good Friday to Remembrance Day. Applies to the inner waters only: Queen Charlotte Strait, Johnstone Strait, Strait of Georgia, Howe Sound, Haro Strait and Strait of Juan de Fuca.

### Marine Weather Observations and Forecast Bulletins

Local weather observations are available for several stations including lighthouses, ocean buoys, automatic weather reporting stations and other stations of the regular weather network. The broadcast listing provides more information on available stations and broadcast times. Marine forecast bulletins are updated at regular intervals or whenever necessary. These bulletins are available on MSC's Automated Telephone Answering Device (ATAD), as well as Weatheradio and Canadian Coast Guard's continuous marine broadcast.

### Weatheradio Canada

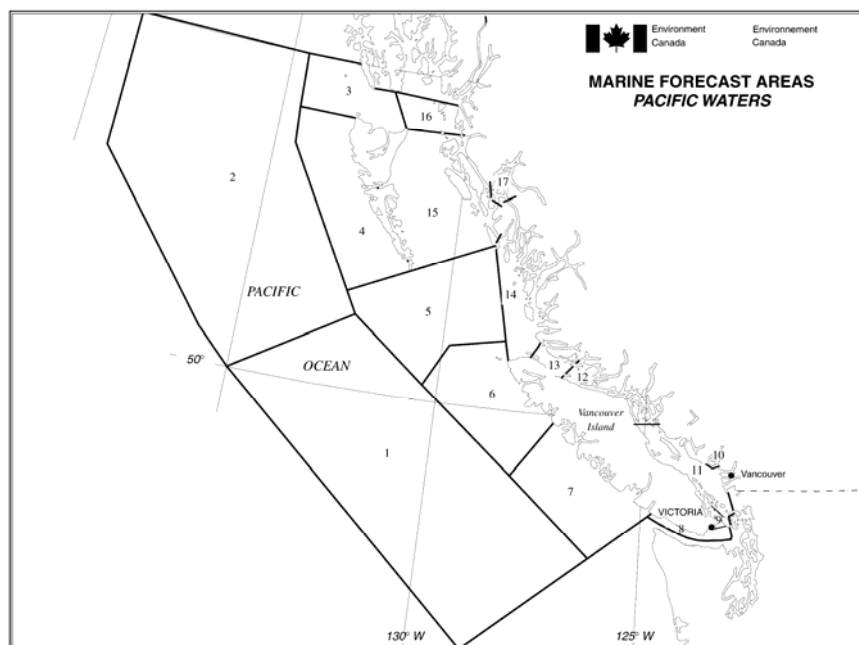
→ Environment Canada Weatheradio operates four main stations serving Pacific region. These are:

Stations	CALL SIGN	Frequency (MHz)	Note
Vancouver – Victoria	XKK506	162.400	Continuous broadcast
Port Hardy (FM)	CBPD-FM	103.700	Continuous broadcast
Ucluelet	CIZ319	162.525	Continuous broadcast
→ Port Alberni	VFM825	162.525	Continuous broadcast

→ Further information regarding EC's Weatheradio network can be obtained via the Internet at <http://www.msc.ec.gc.ca/msb/weatheradio>.

### Buoy Positions – Northeast Pacific

WMO#	NAME	LAT/ LONG	WMO#	NAME	LAT/ LONG
46004	Middle Nomad	50°58.0'N 135°48.0'W	46183	North Hecate Strait	53°37.0'N 131°06.3'W
46036	South Nomad	48°21.2'N 133°55.3'W	46184	North Nomad	53°54.0'N 138°52.0'W
46131	Sentry Shoal	49°54.4'N 124°59.1'W	46185	South Hecate Strait	52°24.4'N 129°47.0'W
46132	South Brooks	49°43.9'N 127°55.4'W	46204	West Sea Otter	51°22.0'N 128°45.1'W
46134	Patricia Bay	48°39.4'N 123°29.0'W	46205	West Dixon Entrance	54°10.0'N 134°20.0'W
46145	Central Dixon Entrance	54°23.0'N 132°25.6'W	46206	La Perouse Bank	48°50.1'N 125°59.9'W
46146	Halibut Bank	49°20.4'N 123°43.6'W	46207	East Dellwood	50°51.6'N 129°54.6'W
46147	South Moresby	51°49.3'N 131°12.1'W	46208	West Moresby	52°30.0'N 132°42.0'W
46181	Nanakwa Shoal	53°50.0'N 128°49.9'W			



### MARINE FORECAST AREAS

#### Pacific waters

Offshore		North coast		South coast	
Area	Area Name	Area	Area Name	Area	Area Name
001	Explorer	003	Dixon Entrance West	006	West Coast Vancouver Island North
002	Bowie	004	West Coast Charlottes	007	West Coast Vancouver Island South
		005	Queen Charlotte Sound	008	Juan de Fuca Strait
		014	Central Coast from McInnes Island to Pine Island	009	Haro Strait
		015	Hecate Strait	010	Howe Sound
		016	Dixon Entrance East	011	Strait of Georgia
		017	Douglas Channel	012	Johnstone Strait
				013	Queen Charlotte Strait

**Marine Weather Observations:**

Lighthouse reports, (**Type L**), Automatic Reporting Stations (**Type A**), Ocean Buoys reports (**Type B**)

Addenbroke Island - <b>L</b>	EastPoint - <b>A</b>	Lennard Island - <b>L</b>	Sartine Island - <b>A</b>
Amphitrite Point - <b>L</b>	Egg Island - <b>L</b>	Lucy Island - <b>A</b>	Saturna Island - <b>A</b>
Ballenas Island - <b>A</b>	Entrance Island - <b>A</b>	McInnes Island - <b>L</b>	Scarlett Point - <b>L</b>
Boat Bluff - <b>L</b>	Entrance Island - <b>L</b>	Merry Island - <b>L</b>	Sentry Shoal - <b>B</b>
Bonilla Island - <b>A</b>	Esquimalt Harbour - <b>A</b>	Middle Nomad - <b>B</b>	Sheringham Point - <b>A</b>
Bonilla Island - <b>L</b>	Estevan Point - <b>L</b>	Nanakwa Shoal - <b>B</b>	Sisters Island - <b>A</b>
Cape Beale - <b>L</b>	Fanny Island - <b>A</b>	Nootka - <b>L</b>	Smith Island (US) - <b>B</b>
Cape Flattery (USA) - <b>B</b>	Friday Harbour, WA - <b>L</b>	North Hecate Strait - <b>B</b>	Solander Island - <b>A</b>
Cape Lazo - <b>L</b>	Green Island - <b>L</b>	North Nomad - <b>B</b>	South Brooks - <b>B</b>
Cape Mudge - <b>L</b>	Grey Islet - <b>A</b>	Pachena Point - <b>L</b>	South Hecate Strait - <b>B</b>
Cape Scott - <b>L</b>	Grief Point - <b>A</b>	Pam Rocks - <b>A</b>	South Moresby - <b>B</b>
Cape St James - <b>A</b>	Halibut Bank - <b>B</b>	Pine Island - <b>L</b>	Trial Island - <b>L</b>
Carmanah Point - <b>L</b>	Herbert Island - <b>A</b>	Point Atkinson - <b>A</b>	Triple Island - <b>L</b>
Cathedral Point - <b>A</b>	Holland Rock - <b>A</b>	Point Wilson - <b>L</b>	Tsawwassen - <b>L</b>
Central Dixon Entrance - <b>B</b>	Ivory Island - <b>L</b>	Port Angeles - <b>L</b>	Victoria Harbour - <b>A</b>
Chatham Point - <b>L</b>	Jericho - <b>L</b>	Prince Rupert - <b>A</b>	Victoria/Gonzales Pt - <b>A</b>
Chrome Island - <b>L</b>	Kelp Reef - <b>A</b>	Pulteney Point - <b>L</b>	West Dixon Entrance - <b>B</b>
Cumshewa Island - <b>A</b>	Kindakun Rocks - <b>A</b>	Quatsino - <b>L</b>	West Moresby - <b>B</b>
Discovery Island - <b>A</b>	La Perouse - <b>B</b>	Race Rocks - <b>A</b>	West Sea Otter - <b>B</b>
Dryad Point - <b>L</b>	Langara Island - <b>A</b>	Rose Spit - <b>A</b>	
East Dellwood - <b>B</b>	Langara Island - <b>L</b>	Sandheads - <b>A</b>	

## NORTHERN CANADA

**Includes: Western and Eastern Arctic, Central and Western Hudson Bay & Major Inland Lakes of Manitoba, Northern Saskatchewan and Northwest Territories.**

### Marine Weather Forecast Program

➔The **Prairie and Arctic Storm Prediction Centre** (Edmonton) provides marine forecasts in support of Arctic marine activity during the open water season from summer into parts of the fall. The forecast area encompasses Lake Athabasca, Great Slave Lake, the Mackenzie River, as well as the waterways of the Western and High Arctic, and Baffin Bay. **Note that wave height forecasts are not produced for the Arctic areas.**

➔The **Prairie and Arctic Storm Prediction Centre** (Winnipeg) provides marine forecasts for Central and Western Hudson Bay, Hudson Strait, Foxe Basin, Ungava Bay, and Davis Strait. Marine forecasts are also provided for Lake Winnipeg (north and south basins), Lake Manitoba and Lake Winnipegosis during the open water season in support of pleasure and commercial activities. **Note that marine forecasts for Eastern Hudson Bay and James Bay are provided by the MSC Quebec Region.**

The forecast program for the Manitoba Lakes continues through the winter months as a public rather than a marine forecast in aid of commercial ice fishing. Minimum and maximum temperatures along with wind chill are included in the forecast.

**Table 7: Production schedule**

#### a) Text format:

Forecast Name	Issue Time	Time Zone	Marine Region
Technical marine synopsis	06:30, 18:30	MDT / MST	Western Arctic
	04:45, 16:45	EDT / EST	Eastern Arctic
Suite of Marine forecasts	05:00, 17:00	MDT / MST	Inland waters
	07:00, 19:00	MDT / MST	Western Arctic Waterway
	05:30, 17:30	EDT / EST	Arctic
	05:00, 17:00	CDT / CST	Western Hudson Bay
	05:30, 17:30	EDT / EST	Southern Nunavut
	05:00, 17:00	EDT / EST	Eastern Nunavut

#### b) NAVTEX format on 518 kHz:

MCTS Centre	Name	Header	Availability
Iqaluit VFF	Navtex	FQCN36 CWNT	05:30, 17:30 EDT / EST

#### Marine Weather Warnings: (refer to Table 1, page 5-1).

Note the following regional particularities:

	Warning Type	Comments
1	<b>Strong wind warning</b>	Applies to Manitoba Lakes, Lake Athabasca, Great Slave Lake and Mackenzie River.

#### Weather and Ice Messages

➔Ship weather and ice reports in the international meteorological code, taken at the standard synoptic hours of 0000, 0600, 1200 and 1800 UTC are solicited from ships of all nationalities which have been recruited by their own national weather service, or other weather services. These reports should be transmitted directly to the circuit using Inmarsat. Alternatively, the observation should be passed to the nearest MCTS Centre, irrespective of the ship's position. Reports made close to, or even within sight of land, are as important as reports made offshore, due to the greater variability of weather conditions in proximity to a coastline. Such reports contribute to the overall knowledge of Arctic weather from both a real-time operational perspective and from a climate perspective.

→The **Prairie and Arctic Storm Prediction Centre** also welcomes weather, sea, and ice observations from the lakes. Real-time observations, and those up to a few hours after the event, are most valuable. Pass observations to 1-800-66STORM (1-800-667-8676).

**Radiofacsimile Package Available: Analyses and prognostics**

→Weather analysis and weather prognostic charts covering Arctic and Hudson Bay waters are prepared at the Arctic Weather Centre, co-located with the Prairie and Arctic Storm Prediction Centre (Edmonton). MCTS Iqaluit and MCTS Inuvik transmit selected charts on radiofacsimile. Please note the MCTS centres access these charts from the Canadian Ice Service (CIS) Website: <http://ice-glaces.ec.gc.ca>. Charts prepared by the Arctic Weather Centre are available directly to subscribers to the CIS Website.

**→Buoys deployed during the open water season**

WMO #	Location / Information	LAT Deg/min	LONG Deg/min
45140	Lake Winnipeg South Basin (moored buoy)	50°48' N	096°44' W
45141	Great Slave (moored buoy - 25 nm northeast of Hay River)	61°1' N	115°19' W
45144	Lake Winnipeg North Basin (moored buoy)	53°15' N	098°15' W
45145	Lake Winnipeg between North and South Basins	51°24' N	096°42' W
45150	Great Slave (moored buoy - immediately west of Inner Whaleback Rocks)	61°55' N	113°45' W
45158	Hudson Bay SW	59°00' N	094°00' W

→The **Great Slave Lake** buoys are deployed in early July and retrieved in late September or early October. They provide hourly wind, air temperature, surface water temperature and wave data.

→The **Lake Winnipeg** South Basin buoys are deployed annually in May or June, and retrieved in October. They provide hourly wind, air temperature, surface water temperature, and wave data.

→The **Hudson Bay** buoy is deployed annually mid to late July and retrieved late September or early October. It provides hourly wind, air temperature, surface water temperature, and wave data.

**Weatheradio Canada**

→Environment Canada Weatheradio operates several stations serving Northern region. These are:

Stations	CALL SIGN	Frequency (MHz)	→Effective Radiated Power (Watts)	→Location
Iqaluit	CIQA	93.3 FM	42	Iqaluit Airport
Inuvik	VBU996	162.400	54	Hidden Lake
Yellowknife	VBC200	162.400	148	Yellowknife Seismic Station
Winnipeg	XLM538	162.550	126	Trizec Building
Riverton	XLF471	162.400	195	Riverton
Long Point	VCI386	162.550	72	Long Point

→**Winnipeg, Riverton and Long Point** provide **continuous** broadcast of marine weather forecasts and warnings for the Manitoba Lakes, and of marine weather observations when available. Further information regarding EC's Weatheradio network can be obtained via the Internet at <http://www.msc.ec.gc.ca/msb/weatheradio>.

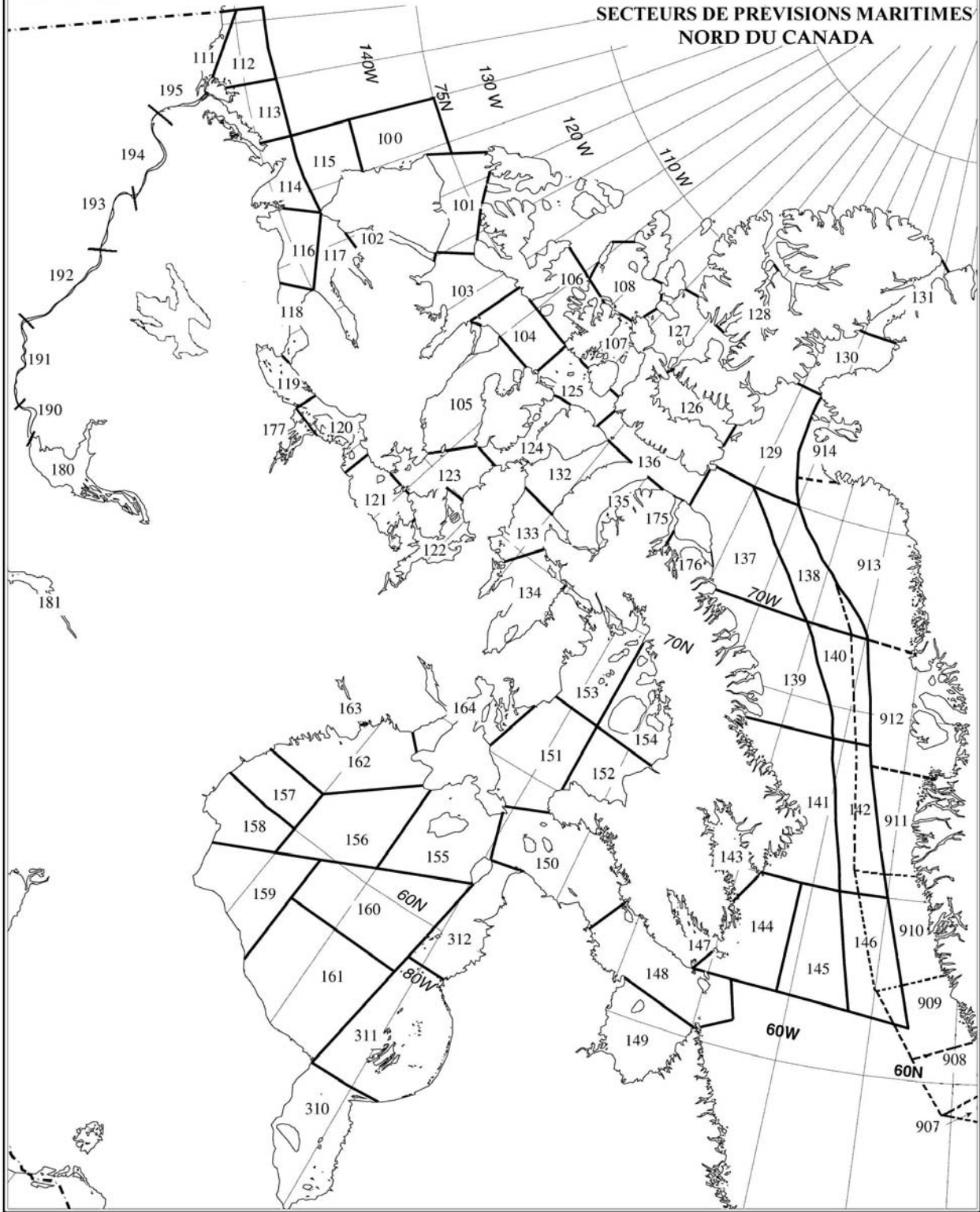


Environnement  
Canada

Environnement  
Canada

# MARINE FORECAST AREAS NORTHERN CANADA

SECTEURS DE PRÉVISIONS MARITIMES  
NORD DU CANADA



## MARINE FORECAST AREAS

### Eastern and Western Arctic Waters

Number	Area Name	Availability Period	Number	Area Name	Availability Period
100	Prince Alfred	Shipping season	138	East Baffin	July-August
101	McClure	Shipping season	139	West Clyde	July 01 - Oct. 31
102	Prince of Wales	Shipping season	140	East Clyde	July-August
103	Melville	Shipping season	141	West Davis	July 01 - Oct. 31
104	Rae	Shipping season	142	East Davis	July 01 - Oct. 31
105	McClintock	Shipping season	143	Cumberland	July 01 - Oct. 31
106	Byam	Shipping season	144	West Brevoort	July 01 - Oct. 31
107	Queens	Shipping season	145	Central Brevoort	July 01 - Oct. 31
108	Maclean	Shipping season	146	East Brevoort	July 01 - Oct. 31
109	(unused)	-	147	Frobisher Bay	July 01 - Oct. 31
110	(unused)	-	148	Resolution	July 01 - Oct. 31
111	Yukon Coast	July 01 - Sept. 30	149	Ungava	July 01 - Oct. 31
112	Mackenzie	July 01 - Oct 10	150	Nottingham	July 01 - Oct. 31
113	Tuktoyaktuk	July 01 - Oct 10	151	West Foxe	Shipping season
114	Baillie	July 15 - Sept. 30	152	East Foxe	Shipping season
115	Banks	Shipping season	153	Igloolik	Shipping season
116	Amundsen	July 15 - Sept. 30	154	Prince Charles	Shipping season
117	Holman	Shipping season	155	Coats	Shipping season
118	Dolphin	July 15 - Sept. 30	156	Central	Shipping season
119	Coronation	July 15 - Sept. 30	157	Arviat	July 01 - Oct. 15
120	Dease	July 15 - Sept. 30	158	Churchill	July 01 - Oct. 15
121	Maud	Shipping season	159	York	Shipping season
122	St. Roch	Shipping season	160	South-central Hudson	Shipping season
123	Larsen	Shipping season	161	South Hudson	Shipping season
124	Peel	Shipping season	162	Rankin	July 01 - Oct. 15
125	Barrow	July 01 - Oct. 31	163	Baker	July 01 - Sept. 30
126	Jones	Shipping season	164	Roes Welcome	Shipping season
127	Norwegian	Shipping season	170	North Tuktoyaktuk	July 01 - Oct. 31
128	Eureka	Shipping season	171	North Mackenzie	July 01 - Oct. 31
129	Clarence	Shipping season	172	West Prince Alfred	July 01 - Oct. 31
130	Kane	Shipping season	173	Northwest Beaufort	July 01 - Oct. 31
131	Robeson	Shipping season	175	Navy Board	July 01 - Oct. 31
132	Regent	Shipping season	176	Pond	July 01 - Oct. 31
133	Boothia	Shipping season	177	Bathurst	July 01 - Oct. 31
134	Committee	Shipping season	310	James Bay	Navigation season
135	Admiralty	Shipping season	311	Belcher	Navigation season
136	Lancaster	July 01 - Oct. 31	312	Povungnituk	Navigation season
137	West Baffin	July 01 - Oct. 31			

**Inland waters**

Number	Area Name	Availability Period
180	Great Slave Lake	June 15 - October 31
181	Lake Athabasca	Open water season
182	Lake Manitoba	Open water season
183	Lake Winnipeg - south basin	Open water season
184	Lake Winnipeg - north basin	Open water season
185	Lake Winnipegosis	Open water season
190	Wrigley Harbour (mile 0) to Axe Point (mile 91)	June 01 - Oct. 20
191	Axe Point (mile 91) to Camsell Bend (mile 290)	June 01 - Oct. 20
192	Camsell Bend (mile 290) to Tulita (mile 512)	June 01 - Oct. 20
193	Tulita (mile 512) to Fort Good Hope (mile 684)	June 01 - Oct. 20
194	Fort Good Hope (mile 684) to Point Separation (mile 913)	June 01 - Oct. 20
195	Point Separation (mile 913) to Kittigazuit Bay (mile 1081)	June 01 - Oct. 20

**Danish Marine Forecasts for Baffin Bay Waters available via:**

**Danish Meteorological Institute, Copenhagen Telephone: (45) 39 15 7500**

Number	Area Name	Period	Number	Area Name	Period
907	Nunap Isuata Kitaa	Year round	911	Attu	Year round
908	Nuuarsuit	Year round	912	Uiffaq	Year round
909	Narsalik	Year round	913	Qimusseriarsuaq	Year round
910	Megquitsoq	Year round	914	Kiatak	Year round

**Marine Weather Observations – manned stations Weather Reports (See note 2) for:**

Aklavik	Lake Winnipeg: Gimli	Norman Wells
Fort MacPherson	Lake Winnipeg: Grand Rapids	Sachs Harbour
Fort Reliance	Lake Winnipeg: George Island	Tuktoyaktuk
Fort Resolution	Lake Winnipeg: Norway House	Yellowknife
Hay River	Lake Winnipeg: Berens River	
Inuvik	Lake Winnipeg: Victoria Beach	

**Marine Weather Observations – Automatic stations Weather Reports (See note 2) for:**

Inner Whale Back Island
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**Marine Weather Observations – Buoy reports Weather Reports (See note 2) for:**

Great Slave Lake Buoy 45141	Lake Winnipeg Buoy 45140 (South Basin)
Great Slave Lake Buoy 45150	Lake Winnipeg Buoy 45144 (North Basin)

(2) When available. Full broadcasts from staffed stations. Temperature and winds from automatic stations and buoys.

## CANADIAN ICE SERVICE (CIS)

### →Ice Forecasts

→Ice forecasts are produced once a day year round. The intent is to advise users of any ice warning conditions that are in effect or that could develop during the day, the evening and the following day, for the areas where a daily ice chart is produced. The forecasts also provide a point by point description of the ice edge.

The iceberg bulletin is produced once a day except in November and December when it is produced from Monday to Friday only. The purpose is to convey routine, general information on the iceberg distribution off the Canadian East Coast. The bulletin provides the estimated limit of all known icebergs and a general description of the number of icebergs for each marine area.

**Table 8: Ice bulletins production schedule**

#### a) Text format:

Forecast name	Issue Time	Time Zone	Marine region
Iceberg bulletin	11:00	EDT/EST	East Coast waters
→Ice forecasts	10:00	EDT/EST	Western and Central Arctic
	11:00	EDT/EST	Hudson and Foxe
	11:00	EDT/EST	Eastern and Northern Arctic
	10:00	EDT/EST	Gulf of St. Lawrence
	10:00	EDT/EST	→East Newfoundland and Labrador waters
	12:00	EDT/EST	Great Lakes

#### b) NAVTEX format on 518 kHz:

MCTS Centre	Name	Header	Availability
St John's VON	Ice NAVTEX	FICN33 CWIS	17:50 (W), 21:50 (S) UTC
Sydney VCO	Ice NAVTEX	FICN34 CWIS	22:10 UTC
Labrador VOK	Ice NAVTEX	FICN35 CWIS	23:20 UTC
Prescott VBR	Ice NAVTEX	FICN38 CWIS	00:40, 12:40 UTC
Thunder Bay VBA	Ice NAVTEX	FICN39 CWIS	06:00, 18:00 UTC
Iqaluit VFF	Ice NAVTEX	N/A	N/A

### Ice Warning Criteria

Warning Name	Warning criteria
<b>1. Ice Pressure warning</b>	→Reported or forecast strong ice pressure.
<b>2. Rapid Closing of Coastal Leads warning</b>	Rapid closing of coastal leads is expected to occur. Leads are corridors of mainly ice-free water surrounded by pack ice.
<b>3. Special Ice warning</b>	Issued when a shipping lane or port has been open for at least 2 weeks and is now expected to become blocked by first year or older ice, or...
	when one tenth or more of greywhite ice or older is expected to move into areas when that ice is not normally present, or...
	for any unusual or significant ice event that will present a hazard to navigation.

### Ice Forecast Program

→Time scales for ice forecasts are relatively long. Useful time scales for ice forecasts are daily, monthly and seasonal. At present, the program provides a 30 day text forecast mainly as a planning tool for operators.

## Ice Reports or Ice Observations

Ice reports from ships or aircraft are normally relayed through MCTS Centres for broadcast. These reports are all assimilated in the daily ice charts produced by CIS.

## Ice Charts Available

Current ice conditions charts are produced on a daily basis. The area covered by the chart depends on the time of year and these charts are normally broadcast at times specified in tables below.

Once a week, CIS produces Regional ice charts. These charts are intended to be used as a planning tool rather than a tactical support tool and are available on the CIS Website at <http://ice-glaces.ec.gc.ca> and through commercial communication lines. They are not broadcast through MCTS Centres.

## Ice Beacons

→ In order to better track the ice drift or to verify ice models, CIS deploys between 4 to 8 ice beacons yearly. While most beacons are only reporting their positions, a few are equipped with barometric pressure sensor and longer lasting battery pack to provide surface pressure information in data sparse regions. These devices drift with the ice/iceberg and are relatively small, so they are very hard to detect from a ship especially if they have been covered with snow. Beacons are deployed primarily in the Central Arctic, Eastern Arctic and the Labrador Coast regions. Through partnership with the International Arctic Buoy Program, CIS will provide, when possible, beacon(s) to be deployed in the Beaufort Sea.

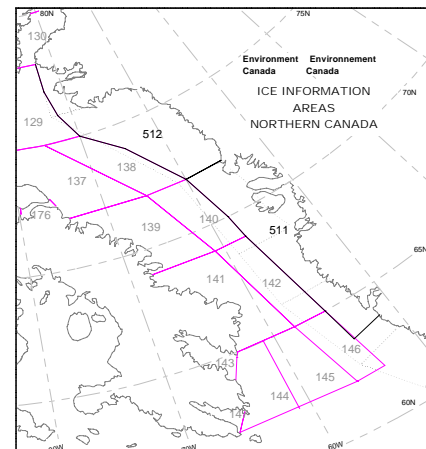
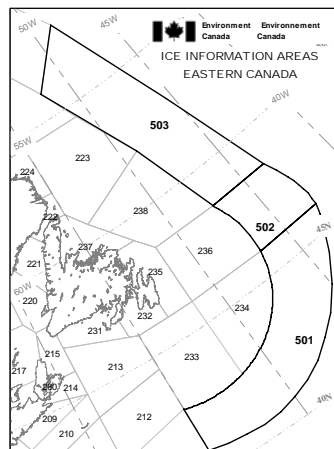
## Weatheradio Canada

→ Detailed ice forecasts are not broadcast via Weatheradio. Mariners planning operations in these waters may obtain details regarding ice conditions by consulting the CIS website, or contacting their regional MCTS Centre. Detailed ice information may also be obtained through consultation with an Environment Canada meteorologist using the “Weather One-on-One” ‘1-900’ service at 1-900-565-5555. For cell phone users and credit card billing call 1-888-292-2222. User fees apply.

## Ice Areas

→ Areas for which ice forecasts apply are identical to the marine forecasts area. In addition to these, ice forecasts will cover Lake Michigan, and may cover 3 areas along the East Coast (501 to 503), and two more off the Greenland Coast (511-512).

- 501 → Tail of the Grand Banks
- 502 Flemish
- 503 Southeast Labrador Sea
- 511 Greenland Central
- 512 Greenland North
- 541 Lake Michigan



## Ice charts

The following list describes ice charts produced to support Canadian Coast Guard operations which are available for broadcast. All **available** charts can be transmitted or re-transmitted on request. **MCTS broadcast times** are found in Chapter 2. **METOC Halifax broadcast times** are found immediately following this section.

Ice Chart (when available)	Broadcast site	Season
Iceberg limit	MCTS Sydney	Year round
Gulf of St. Lawrence	METOC Halifax MCTS Sydney	Winter Winter
→ Northeast or Southeast Newfoundland Waters	METOC Halifax MCTS Sydney	Winter Winter
Labrador Coast	METOC Halifax MCTS Iqaluit	Winter Summer
Hudson Strait	MCTS Iqaluit	Summer
Northern Hudson Bay	MCTS Iqaluit	Summer
Southern Hudson Bay	MCTS Iqaluit	Summer
Foxe Basin	MCTS Iqaluit	Summer
Davis Strait	MCTS Iqaluit	Summer
Baffin Bay	MCTS Iqaluit (Resolute) MCTS Iqaluit	Summer
Approaches to Resolute	MCTS Iqaluit (Resolute)	Summer
Resolute - Byam	MCTS Iqaluit (Resolute)	Summer
→ Eureka	MCTS Iqaluit (Resolute)	Summer
Parry Channel	MCTS Iqaluit (Resolute)	Summer
McClure Strait	MCTS Iqaluit (Resolute) MCTS Inuvik	Summer
Queen Maud	MCTS Iqaluit (Resolute) MCTS Inuvik	Summer
Amundsen Gulf	MCTS Inuvik	Summer
Alaskan Coast	MCTS Inuvik	Summer
Bering Strait	MCTS Inuvik	Summer

For correct reception of this broadcast on WMO standard facsimile recorders requiring 2300 Hz for White and 1500 Hz for Black, 1800 Hz centre frequency, radio receivers should be tuned in the **UPPER SIDEBAND MODE** or **USB**: add **1.6 to 1.8** to the indicated frequencies.

**METOC Halifax (CFH)**: Broadcasts intended for North Atlantic waters North of 35N and West of 35W. Radiofacsimile transmission commences with a 30 second break followed by a 30 second signal.

NAME	Call Sign	Modulation	Index of Cooperation	Power	Frequencies (kHz)	Drum speed
MCTS Iqaluit	<b>VFF</b>	J3C (FM)	576	5 KW	3251.1, 7708.1 ( <b>USB</b> )	120 RPM
MCTS Inuvik	<b>VFA</b>	J3C (FM)	576	1 KW	8456.0, 8457.8 ( <b>USB</b> )	120 RPM
METOC Halifax	<b>CFH</b>	J3C (FM)	576	6 KW	4271, 6496.4, 10536, 13510	120 RPM
METOC Halifax	<b>CFH</b>	J3C (FM)	576	10 KW	122.5	
MCTS Sydney	<b>VCO</b>	J3C (FM)	576	5 KW	4416, 6915.1	120 RPM

## Facsimile Broadcast

Upon authorized request from Canadian Coast Guard, C-GCFR can transmit observed conditions via satellite fax. Vessels must make a request through the Canadian Coast Guard to receive it.