

PART 5

Environment Canada Marine and Ice Warning and Forecast Programs

Background

The Meteorological Service of Canada (MSC) of Environment Canada and the regional Meteorological Service Branch offices of Environment Canada operate Canada's weather service. MSC offices offer 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 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 the issuance of weather warnings are based on national guidance, but determined regionally based on appropriate climatology and the character of the regional marine community. The following table describes the warning program:

Table 1: Synoptic warnings

Synoptic warnings *	Warning criteria
Strong wind warning ⁽²⁾	Winds ⁽¹⁾ 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 ⁽¹⁾ 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 ⁽¹⁾ 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 ⁽¹⁾ 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.

(1) Gusts are excluded from the definition.

(2) 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: when a range is used to describe the wind speed, the upper value of the range determines the warning category.

**Table2: Localized warnings**

Localized warnings/watches *	warning criteria
Squall watch	Advance notice of conditions that are favorable 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 favorable 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 favorable to the development of cold-air waterspouts.
High coastal waters warning	To warn mariners and coastal populations of high impacts caused by abnormal heights of the water and waves on coastal areas
Special marine warning/watch	Used to describe other conditions deemed dangerous to navigation that could not be described with a specific warning in the discussion text of the warning.

Notes:

* These warnings/watches are delivered using separate messages.



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

Marine Forecast program and ice bulletins

Marine forecasts are issued for the offshore economic zone including the St. Lawrence Seaway and major inland waters. For sea ice, useful forecast time scales are generally much longer. Basic forecasts for the general sea-ice conditions include weekly, monthly and seasonal time frames. 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	The bulletin provides the positions and trends of the main weather systems for the period Day 1 and Day 2.
Marine forecast (or Regular marine forecast)	The forecast provides information on: synoptic warnings, wind, visibility, precipitation, and freezing spray. It may include air temperature as appropriate. This is valid for Day 1 and Day 2.
Recreational boating marine forecast	This is a forecast for recreational boaters and is available only in specific regions.
Marine weather statement	The statement provides additional information on weather. It will be issued only as needed.
Wave height forecast	The forecast provides information on significant wave heights valid for Day 1 and Day 2. It is not available for the Arctic waters or Hudson Bay.
Extended marine forecast	Provides a 3 to 5 day wind outlook. The forecast is primarily a planning tool.
Iceberg bulletin	The bulletin provides information on icebergs valid for the time of issue of the bulletin.
Ice hazard bulletins	The bulletin provides information on hazardous ice conditions valid for Day 1 and Day 2.
NAVTEX ¹	A NAVTEX compatible bulletin issued with each Regular marine forecast or ice bulletin.
MAFOR ¹	This is a specialized coded marine forecast produced for Quebec and Ontario.

¹: 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 program.

Marine Forecast and Ice Areas

Marine forecasts and ice bulletins 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: Current temperature, wind speed and direction, atmospheric pressure, sky conditions, precipitation type, restrictions to visibility, sea state.

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. WEB access. All forecast and warning information will be found at the following address:
http://www.weatheroffice.ec.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 World Meteorological Organization (WMO) auspices, the VOS has near 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 vessels 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 ship officers for their fine work, dedication, and commitment.

Check out the SEAS program with your local Port Meteorological Officer. In the SEAS program, observations are sent via INMARSAT C and the cost of transmission is absorbed by a consortium of countries interested in timely reports from the seas of the world.

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, which could result in the buoy becoming adrift and a costly recovery of 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.

MAREP (MARine REporting Program)

MAREP gives mariners the opportunity to informally report local weather conditions and to receive up-to-date weather forecasts and warnings. MAREP stations are generally operated on a semi-volunteer basis by a member of the marine community who is concerned about marine safety. The stations operators are in regular contact with the Marine Weather Forecaster of the area.

Since the program is informal, the individuals at the stations do not provide a 24 hour service, but are likely available during day-time and early evening hours.

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, 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.

☉ If a PMO visits your ship, remember to ask questions about observing and coding, and reporting weather and ice. Keep the PMO informed of your mailing address. Discuss forecast, warnings, facsimile products, especially if you have specific problems. The PMO will contact the appropriate party for investigation. The PMO is also responsible to recruit new vessels wishing to participate in the VOS program.



Table 4: Port meteorological officers

Great Lakes	Atlantic - Maritimes	Atlantic - Newfoundland
<p>Tony Hilton, Supervisor Rick Shukster, Buoy Specialist Roland Kleer, PMO Shawn Livingstone, PMO Environment Canada, MSC 100 East Port Blvd Hamilton ON L8H 7S4 Tel: 905-312-0900 Fax: 905-312-0730 Email: anthony.hilton@ec.gc.ca</p>	<p>Randy Sheppard, Supervisor Derek Cain, PMO Environment Canada, MSC 45 Alderney Drive, 16th floor Dartmouth NS B2Y 2N6 Tel: 902-426-6616 Cell: 902-456-6927 Fax: 902-426-6404 Email: randy.sheppard@ec.gc.ca</p>	<p>Andre Dwyer, PMO Environment Canada, MSC 6 Bruce St. Mount Pearl NL A1N 4T3 Tel: 709-772-2167 Cell: 709-689-5787 Fax: 709-772-5097 Email: andre.dwyer@ec.gc.ca</p>
St-Lawrence - Québec	Pacific	Great Slave Lake / Western Arctic
<p>Erich Gola, PMO Environnement Canada, SMC Canada Place Bonaventure, Portail Nord-Est 800 de la Gauchetière ouest, Suite 810 Montreal QC H5A 1L9 Tel: 514-283-1644 Fax: 514-496-1867 Email: erich.gola@ec.gc.ca</p>	<p>Bruce Lohnes, Supervisor Mike Riley, PMO Hamid Nasr, PMO Environment Canada, MSC 140 13160 Vanier Place Richmond BC V6V 2J2 Tel: 604-664-9188 Fax: 604-664-4094 Email: bruce.lohnes@ec.gc.ca</p>	<p>Ben Lemon, PMO Environment Canada, MSC M.J. Greenwood Centre 9345 - 49 Street Edmonton AB T6B 2L8 Tel: 780-495-6442 Email: ben.lemon@ec.gc.ca</p>
Manitoba Lakes / Lake Athabaska		
<p>Barry Funk, PMO Monitoring and Systems Environment Canada, MSC Suite 150 123 Main Street Winnipeg MB R3C 4W2 Tel: 204-984-2018 Email: barry.funk@ec.gc.ca</p>		



NAVTEX

MSC will provide CCG with NAVTEX information based on international IMO standards. These standards are:

Service for coastal & offshore areas:

I. **Warnings** (Winds & ice accretion),

II. **Synopsis** (major feature),

III: **Forecasts** (wind, visibility, ice accretion, wave height)

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



NAVTEX service sample (518 kHz)

Header ▶ FQCN34 CYOX 171330
 Title (VCO part two) ▶ NAVTEX/2 FOR SYDNEY VCO.
 ▶
Weather forecast
 Parameters ▶ VLD 17/13Z-19/03Z.
 Marine areas ▶ NORTHEAST GULF, GULF-PORT AU PORT:
 Warning ▶ WNG: NIL.
 Wind ▶ WND: S10-15G20. 17/23Z S10-15. 18/11Z S15-20. 18/18Z SW20.
 Visibility ▶ VIS: 17/12Z-19/02Z FG-PTH.
 {... other marine areas}
 End of weather ▶ END/
Wave forecast
 Parameters ▶ WAVES(M) VLD 17/09Z-18/09Z.
 Marine areas ▶ NORTHEAST GULF:
 Waves ▶ 1-2. 18/06Z 0-1.
 {... other marine areas}
 End of waves and part two ▶ END/



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

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

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

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 conc.

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

heavy	HVY	moderate	MOD	strong	STRG
light	LGT	pressure	PRESS		

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		



SUGGESTIONS / COMMENTS / COMMENTAIRES

<p>Help us to serve you:</p> <p>Make us aware of your comments regarding the Environment Canada Marine and Ice services</p>	<p>Aidez-nous à mieux vous servir :</p> <p>Faites-nous parvenir vos commentaires concernant le programme de prévisions maritimes d'Environnement Canada</p>
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Officer / Officier		<p>Return to / Envoyer à: National Marine Services manager Gestionnaire des services maritimes nationaux IMSB, 3 floor/étage 373 Sussex, Ottawa, Ontario, Canada K1A 0H3 Fax: 613-996-4218 E-Mail/courriel: Normand.Michaud@ec.gc.ca</p>
Ship / navire :		
Position Latitude :		
Longitude :		
Date :		

Sujet / Détails:

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PACIFIC COAST

Marine Weather Forecast Program

The Pacific Weather Centre issues 4 forecasts (regular forecast and synopsis) daily at the same time throughout the year. The forecasts are valid up to the end of the next day. A 3 to 5 day outlook and wave height forecasts are issued twice a day.



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:

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

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

Note the following regional particularities:

	Warning Types	Comments
1	Strong wind warning	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.

Weather 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.

MAREP

MAREP operators are in regular contact with the Marine Weather Forecaster at the Pacific Weather Centre. MAREP reports are also received by MCTS Centres on VHF channels 26 or 84 at any time, subject to normal priorities of communication. These reports are sent to marine forecasters at the Pacific Weather Centre and will be included on the CMB if they are significantly different from conditions mentioned in the forecast or from nearby reports.

The MAREP stations of Cape Scott and Bonilla Island operates from October 1 to April 30. Kyuquot operates from May 1 to September 30.

WEST COAST MAREP STATIONS

contact on **VHF MAREP WORKING CHANNEL 69** or on alternate VHF channels 10 and 78A

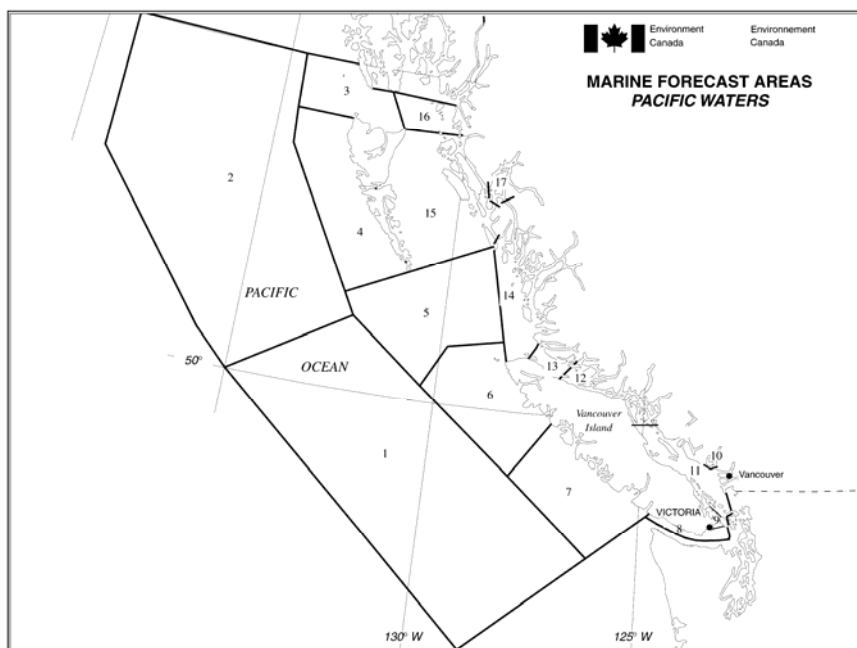
Station	Call Sign	Weather Information For
Bonilla Island Lightstation	XLA787	Dixon Entrance East, Hecate Strait, Central Coast
Cape Scott Lightstation	VGL35	Queen Charlotte Sound, Central Coast, Queen Charlotte Strait, West Coast Vancouver Island North.
Kyuquot	VGL34	West Coast Vancouver Island North. West Coast Vancouver Island South.

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			

Victoria Weatheradio Canada


Stations	CALL SIGN	Frequency (MHz)	Note
Saltspring Island	CFA240	162.400	Continuous broadcast



MARINE FORECAST AREAS

Pacific waters

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

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**, Environment Canada, 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, the waterways of the western and high Arctic, Baffin Bay and Davis Strait, Foxe Basin, Hudson Strait and Ungava Bay, and central and western Hudson Bay. Quebec Region provides marine weather forecasts for eastern Hudson Bay and James Bay. **Note that sea state forecasts are not produced for the Arctic areas.**

The Storm Prediction Centre, Environment Canada, Winnipeg, provides marine forecasts for Lake Winnipeg (north and south basins), Lake Manitoba and Lake Winnipegosis during the open water season in support of pleasure and commercial activities. 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
	07:30, 19:30	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	Strong wind warning	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. Alternately, the observation should be passed to the nearest Marine Communications and Traffic Services 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 knowledge of Arctic weather from both a real-time operational perspective and from a climate perspective.

The **Prairie 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. MCTS Iqaluit and MCTS Inuvik transmit selected charts on radiofacsimile. Please note the MCTS Centres access these charts from a web site at the Canadian Ice Service (CIS). Arctic Weather prepared charts are available directly to subscribers of the Canadian Ice Services Web site.

Buoys – the following buoys are usually in place 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°11'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. The buoys provide hourly wind and temperature data and include surface water temperature and wave data.

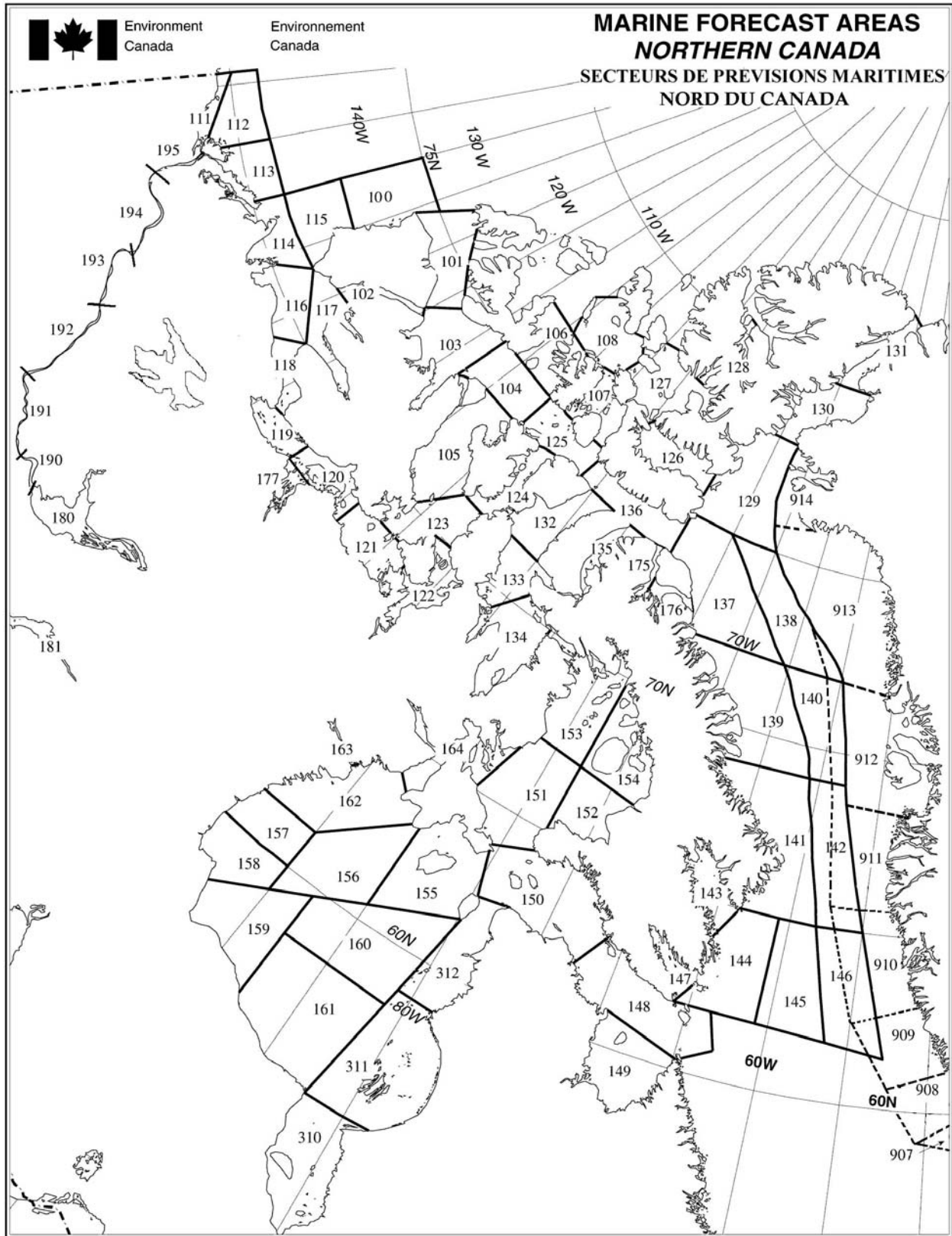
The **Lake Winnipeg** South Basin buoys are deployed annually in May or June, and retrieved in October. The buoys provide hourly wind and temperature data and include surface water temperature data. The buoys also provide wave data.

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

Weatheradio Canada

Stations	CALL SIGN	Frequency (MHz)	Power	Location
Iqaluit	CIQA	93.3 FM		Iqaluit
Inuvik	VBU996	162.400	53.7 Watts ERP	Hidden Lake
Yellowknife	VBC200	162.400	150 Watts ERP	Yellowknife Seismic Station
Winnipeg	XLM538	162.550		
Riverton	XLF471	162.400		
Long Point	VCI386	162.550		

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.



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

Inland waters

Number	Area name	Availability period
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 Tel: (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	Meqquitsoq	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

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 Bulletins

Ice hazard bulletins 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 bulletins 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 hazard bulletin	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 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	10:00 EDT/EST
Sydney VCO	Ice NAVTEX	FICN34 CWIS	10:00 EDT/EST
Labrador VOK	Ice NAVTEX	FICN35 CWIS	10:00 EDT/EST
Prescott VBR	Ice NAVTEX	FICN38 CWIS	12:00 EDT/EST
Thunder Bay VBA	Ice NAVTEX	FICN39 CWIS	12:00 EDT/EST
Iqaluit VFF	Ice NAVTEX	N/a	N/a

Ice Warning Criteria

Warning Name	Warning criteria
1. Ice Pressure warning	Reported or forecast strong ice pressure in coastal areas, channels or ice pack.
2. Rapid Closing of Coastal Leads warning	Rapid closing of coastal leads is expected to occur.
3. Special Ice warning	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.
	When one tenth or more of greywhite ice or older is expected to move into areas when that ice is not normally present.
	Any unusual or significant ice event that will present a hazard to navigation.

Ice Forecast Program

Time scales for ice forecasts are relatively longer. Useful time scales for ice forecasts are weekly, monthly and seasonal. At present, the program provides a 30 day text forecast mainly as a planning tool for operators. Forecasts for specific areas and time scales are produced on demand on a cost-recovery basis.

Ice Reports, Ice Observations

Ice reports from ships or other airborne platforms 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 to users 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 (locators) yearly. These devices drift with the ice and are relatively small, so they are very hard to detect from a ship. The beacons are deployed in the Beaufort sea polar pack (1 beacon), in Baffin Bay (1 to 3 beacons), off the East Coast of Labrador or Newfoundland (1 to 3) and in the Gulf of St Lawrence (2 to 4).

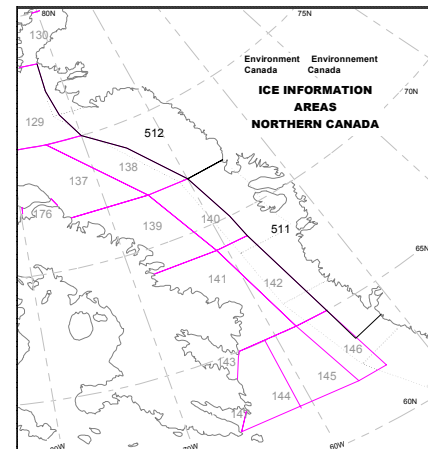
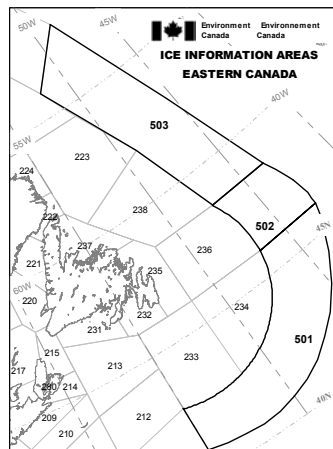
Weatheradio Canada

Ice bulletins are not directly broadcast via Weatheradio. Rather, the regions capture the ice bulletins from the Environment Canada communication network and check if there is an ice warning in effect. If there is one, the warning will normally be added to the regular marine synopsis which is normally broadcast via the Weatheradio network.

Ice areas

Areas for which ice bulletins apply are identical to the marine forecasts area. In addition to these, ice bulletins will cover Lake Michigan, and may cover 3 areas along the East Coast (501 to 502), and two more off the Greenland Coast (511-512).

- 501 Tail of the Bank
- 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
East 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 Sound	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 2300Hz 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	VFF	J3C (FM)	576	5 KW	3251.1, 7708.1 (USB)	120 RPM
MCTS Inuvik	VFA	J3C (FM)	576	1 KW	8456.0, 8457.8 (USB)	120 RPM
METOC Halifax	CFH	J3C (FM)	576	6 KW	4271, 6496.4, 10536, 13510	120 RPM
METOC Halifax	CFH	J3C (FM)	576	10 KW	122.5	
MCTS Sydney	VCO	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.