

Beaufort

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Force	Wind speed km/h	Knots	Descriptive term	Effects observed at sea	<i>Effects observed on land</i>
0	less than 1	less than 1	Calm	Sea surface like a mirror, but not necessarily flat.	<i>Smoke rises vertically.</i>
1	1 to 5	1 to 5	Light air	Ripples with the appearance of scales are formed, but without foam crests.	<i>Direction of wind shown by smoke drift but not wind vanes.</i>
2	6 to 11	4 to 6	Light breeze	Small wavelets, still short but more pronounced. Crests do not break. When visibility good, horizon line always very clear.	<i>Wind felt on face. Leaves rustle. Ordinary vane moved by wind.</i>
3	12 to 19	7 to 10	Gentle breeze	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered whitecaps.	<i>Leaves and small twigs in constant motion. Wind extends light flag.</i>
4	20 to 28	11 to 16	Moderate breeze	Small waves, becoming longer. Fairly frequent whitecaps.	<i>Raises dust and loose paper. Small branches are moved.</i>
5	29 to 38	17 to 21	Fresh breeze	Moderate waves, taking a more pronounced long form. Many whitecaps are formed. Chance of some spray.	<i>Small trees in leaf begin to sway. Crested wavelets form on inland waters.</i>
6	39 to 49	22 to 27	Near gale	Large waves begin to form. The white foam crests are more extensive everywhere. Probably some spray.	<i>Large branches in motion. Whistling heard in telephone wires. Umbrellas used with difficulty.</i>

Beaufort scale

Force	Wind speed		Descriptive term	Effects observed at sea	<i>Effects observed on land</i>
	km/h	Knots			
7	50 to 61	28 to 33	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	<i>Whole trees in motion. Inconvenience felt in walking against wind.</i>
8	62 to 74	34 to 40	Gale	Moderately high waves of greater length. Edges of crests begin to break into the spindrift. The foam is blown in well-marked streaks along the direction of the wind.	<i>Breaks twigs off trees. Generally impedes progress. Walking into wind almost impossible.</i>
9	75 to 88	41 to 47	Strong gale	High waves. Dense streaks of foam along the direction of the wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility.	<i>Slight structural damage occurs, eg. roofing shingles.</i>
10	89 to 102	48 to 55	Storm	Very high waves with long overhanging crests. Dense white streaks of foam. Surface of the sea takes a white appearance. The tumbling of the sea becomes heavy and shock-like. Visibility affected.	<i>Trees uprooted. Considerable structural damage occurs.</i>
11	103 to 117	56 to 63	Violent storm	Exceptionally high waves. Sea completely covered with long white patches of foam. Visibility affected.	<i>Widespread damage.</i>
12	118 to 133	64 to 71	Hurricane	Air filled with foam and spray. Sea entirely white with foam. Visibility seriously impaired.	<i>Rare.</i>

Handy references

On board

-  Safe Boating Guide
-  Nautical Charts
-  Sailing Directions
-  Tide and current tables
-  Marine Weather Guide
The Secrets of the St Lawrence
-  Weather forecasts

Winds

	knots	mi/h	km/h	Beaufort
Light	0 to 12	0 to 14	0 to 22	0 to 3
Breeze	13 to 19	15 to 22	24 to 35	4 to 5
Strong	20 to 33	23 to 38	37 to 61	6 to 7
Gale	34 to 47	39 to 54	63 to 87	8 to 9
Storm	48 to 63	55 to 73	89 to 117	10 to 11
Hurricane	64 and +	74 and +	118 and +	12

Barometric pressure

millibars or hectopascals	kilopascals	inches of mercury
1000	100	29.5

Douglas seastate scale

Code	Type of sea	Significant wave height (m)
0	Calm	0
1	Smooth	0 to 0.1
2	Slight	0.1 to 0.5
3	Moderate	0.5 to 1.25
4	Rough	1.25 to 2.5
5	Very rough	2.5 to 4.0
6	High	4 to 6
7	Very high	6 to 9
8	Pecipitous	9 to 14
9	Confused	more than 14

Not to be confused with the Beaufort Scale

Reference works consulted

- [Climatological Charts of the St Lawrence](#)
Environment Canada, Québec Region, 1984
- [Comment descendre et remonter du Saguenay en passant par la Petite rivière Saint-François](#)
Commander Jules DesChamps, CPS
- [Douglas seastate scale](#)
Dictionnaire de l'Océan, Conseil international de la langue française - Paris, France 1989
- [East Coast Marine Weather Manual](#)
Environment Canada, Atlantic Region, 1989
- [Gulf of St Lawrence](#)
Notes. Ice Climatology, Environment Canada
- [Gulf of St Lawrence Marine Weather Guide](#)
Environment Canada, Atlantic Region, 1991
- [Le français au bureau](#)
Cajolet-Laganière, Hélène, Les Publications du Québec, 1988
- [Le Guide nautique de la Côte-Nord](#)
Club nautique de Sept-Îles inc.
- [Marine Weather Hazards Manual \(West Coast\)](#)
Environment Canada, 1990
- [Météorologie marine](#)
R. Mayençon, Éditions Maritime & d'Outre-Mer, 1982
- [Nautical Charts](#)
Hydrographic Service of Canada, Fisheries and Oceans Canada
- [Répertoire toponymique du Québec](#)
Commission de toponymie du Québec, 1991
- [Sailing Directions - St Lawrence River and Gulf](#)
Hydrographic Service of Canada, Fisheries and Oceans Canada
- [Yachtsman's Guide of the Saint-Laurent](#)
Québec Sailing Federation
- [Weather at Sea](#)
David Houghton and Fred Sanders, Highmark Publishing Ltd, 1988

Suggested publications

- [Connaitre la Météorologie](#)
Richard Leduc et Raymond Gervais
- [Learning Weather](#)
Canada Communication Group - Printing
- [Climatological Charts of the St Lawrence](#)
- [Marine Weather Services](#)
- [Weather Services for Mariners, Fishermen and Yachtsmen](#)
Environment Canada
- [Safe Boating Guide](#)
Canadian Coast Guard, Transport Canada

Meteorology courses

As an aid for mariners, this publication deals only with the wind's behaviour over different topographical features and the sea, and with the sea's behaviour.

To find out more or to specialize in meteorology and sailing, you may wish to enrol in one of the many courses offered by various institutions and groups, all of them drawing on the wide-ranging knowledge and experience of seasoned mariners.

- Cégep de Rimouski Institut maritime du Québec
 Montréal - Québec - Rimouski
- Cégep de la Gaspésie et des Îles
 Centre des pêches de Grande-Rivière
- Cégeps Services socio-culturels
- Canadian Power and Sail Squadrons
- Québec Sailing Federation 🚩

The crew

Our sincere thanks to all our contributors

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 - Grande-Rivière
 - Les Escoumins
 - Matane
 - Rivière-au-Renard
 - Rivière-au-Tonnerre
 - Sept-Îles — Port-Cartier
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Working together to ensure safe sailing for everyone!

You can also help to improve this publication, by calling one of our weather offices or writing to us at the address inside the front cover.*

Air mass

A large volume of air with uniform properties of temperature and moisture. Air masses extend over thousands of square kilometres.

Breaker

A swell wave that has broken into foam.

Chop

Irregular motion of waves, in which it is difficult, if not impossible, to find one's bearings. Creates a confused sea. Produced on top of rip by wind blowing against the current.

Deep water

Water depths more than one-half the wavelength of a wave.

Fog

Minute water droplets suspended in the air that reduce visibility to less than one nautical mile. Fog is cloud on the ground.

Front

The line of separation between 2 air masses with different temperatures and moisture levels. A warm front is a mass of warm air displacing a mass of cold air, and vice versa.

Haze

Same phenomenon as fog, except that visibility is equal to or greater than 1 nautical mile.

High

A region of high pressure. Air flows outwards and clockwise around high pressure areas. A high is usually associated with good weather.

Isobar

Line on a weather map joining points of equal pressure.

Low

A region of low pressure. Winds flow counterclockwise around the low centre. A low pressure centre is usually a storm centre accompanied by precipitation and strong winds.

Main cabin

On a ship or pleasure boat, the main room in which the crew gathers to plan routes and manoeuvres.

Millibar

A unit used to measure barometric pressure.

Northwest gyre

Slow gyrating motion of sea water. In the Gulf of St Lawrence, this counterclockwise motion may extend over 200 kilometres. The gyre's axis is located in the Northwestern part of the Gulf, between Anticosti and Pointe-des-Monts. Its speed is almost imperceptible: slightly more than 0.10 knot.

Radiocopy

Transcription of a message received by radio, or name of the computer system by means of which such messages are transcribed automatically or are pre-recorded. Radiocopy is an exclusive Weatheradio Weathercopy service.

Radiograms

A message transmitted by radio, in particular by Weatheradio or Coast Guard radio.

Ridge

An elongated area of high pressure, associated with a high.

Rip

Turbulence on the sea's surface that results when 2 currents meet.

Sea

Combined wind waves and swell. **Cross sea** - Confused sea formed when one train of waves moves at an angle to other groups of waves. The sea becomes steep, with short, sharp wave crests. When cross seas combine with an underlying tidal current, the sea surface becomes especially confused and hazardous. Also known as **cross swell**. **Choppy sea** - Short, sharp, breaking waves. Typically caused by the reflection effect. **Breaking sea** - Unstable sea resulting from steep, breaking or near-breaking waves.

Significant wave height

Average height of the highest 33 % of all the waves present.

Squall

A brief, violent windstorm, often accompanied by rain or snow. Squalls are generally associated with cumulonimbus clouds. If they accompany a fast-moving cold front, they may be of longer duration.

Strong winds

By convention, combination of forces 4, 5 and 6 on the Beaufort Scale to indicate sustained wind speeds in the range of 20 to 33 knots.

Trough

An elongated area of low pressure, associated with a low, often produces a wind shift and showery weather.

Wave steepness

Slope of a wave that may not exceed 14 %. Beyond that point, the crest will break and the wave will tumble.

Weatheradio

This is the name of Environment Canada's weather information broadcast network. The network has transmitters in every region. Mariners interested in listening to this network need a receiver which can be purchased from electronic equipment dealers. Many portable models are available. **Weatheradio** signals warnings of severe weather automatically to receivers equipped with special alarm devices for that purpose.

Zephyr

A soft, warm and gentle breeze. For the Ancients, this was the West wind 🌬️

Stations

Environment Canada marine weather reporting stations

- 1 Kingston
- 2 Watertown*
- 3 Messina*
- 4 Dorval
- 5 Trois-Rivières
- 6 Saint-François-de-l'Île-d'Orléans
- 7 Île-aux-Grues
- 8 Île Rouge
- 9 Île Bicquette
- 10 Baie-Comeau
- 11 Pointe-des-Monts
- 12 Cap-Chat
- 13 Buoy: 49°33' - 65°52'
- 14 Cap de la Madeleine
- 15 Cap d'Espoir
- 16 Port-Menier
- 17 Havre-Saint-Pierre
- 18 Pointe Heath
- 19 Natashquan
- 20 Cap Whittle
- 21 Blanc-Sablon

Newfoundland

- 22 Daniel Harbour
- 23 Stephenville
- 24 Port-aux-Basques
- 25 Île Saint-Paul
- 26 Îles-de-la-Madeleine

New Brunswick

- 27 Chatham
- 28 Miscou
- 29 Charlo

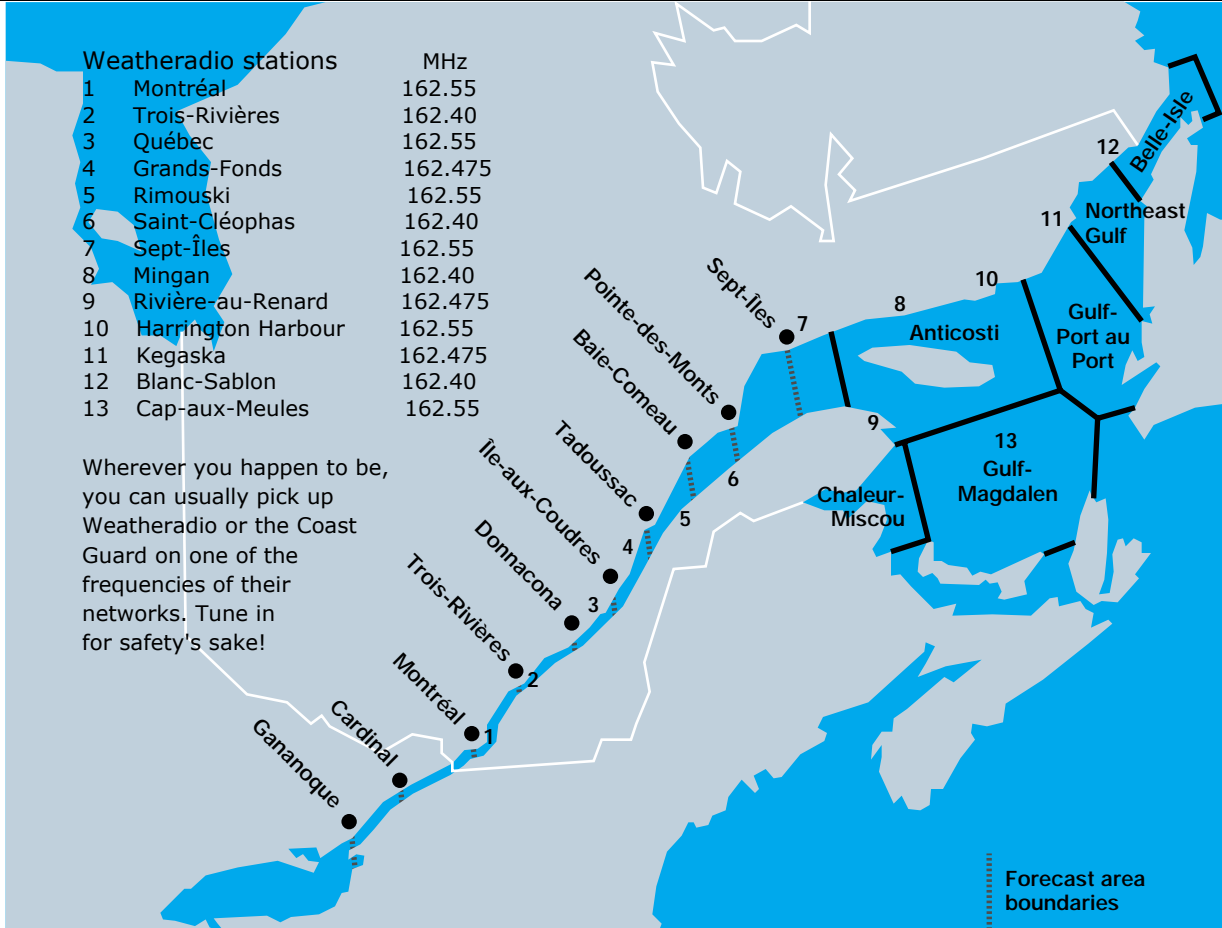
* United States network

The St Lawrence: River - Central and Northern Gulf

Areas

Weatheradio stations	MHz
1 Montréal	162.55
2 Trois-Rivières	162.40
3 Québec	162.55
4 Grands-Fonds	162.475
5 Rimouski	162.55
6 Saint-Cléophas	162.40
7 Sept-Îles	162.55
8 Mingan	162.40
9 Rivière-au-Renard	162.475
10 Harrington Harbour	162.55
11 Kegaska	162.475
12 Blanc-Sablon	162.40
13 Cap-aux-Meules	162.55

Wherever you happen to be, you can usually pick up Weatheradio or the Coast Guard on one of the frequencies of their networks. Tune in for safety's sake!



Forecast area boundaries