

# International Navigating Conditions (01/11/03)

## North America (East)

### ■ Navigating Limits

Unless and to the extent otherwise agreed by the Underwriters, the vessel shall not enter, navigate or remain in the areas specified below at any time or, where applicable, between the dates specified below (both days inclusive):

#### Area 5 – North America (East)

- (a) North of 52° 10' N. Lat. and between 50° W. Long. and 100° W. Long.
- (b) Gulf of St. Lawrence, St. Lawrence River and its tributaries (east of Les Escoumins), Strait of Belle Isle (west of Belle Isle), Cabot Strait (west of a line between Cape Ray and Cape North) and Strait of Canso (north of the Canso Causeway), between 21st December and 30th April.
- (c) St. Lawrence River and its tributaries (west of Les Escoumins) between 1st December and 30th April.
- (d) St. Lawrence Seaway.
- (e) Great Lakes.

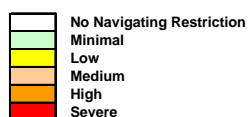


Any conditions herein are non-binding and set out by way of guidance only.  
Underwriters are free to offer any conditions they deem appropriate.

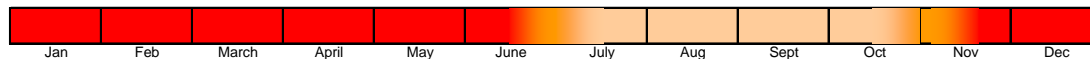


Map courtesy of Lloyd's Marine Intelligence Unit, [www.lloydsmiu.com](http://www.lloydsmiu.com)

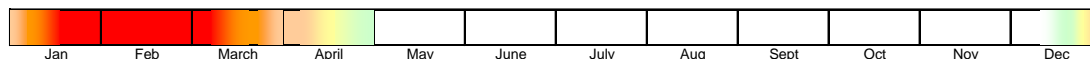
## ■ Perceived Degree of Enhanced Risk



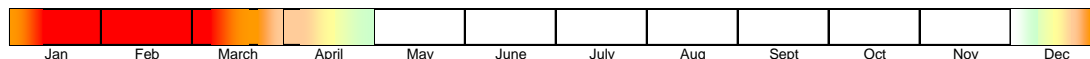
Area 5(a) North of 52° 10' N. Lat. and between 50° W. Long. And 100° W. Long.



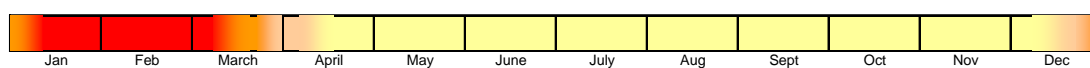
Area 5(b) Gulf of St. Lawrence, St. Lawrence River and its tributaries (east of Les Escoumins), Strait of Belle Isle (west of Belle Isle), Cabot Strait (west of a line between Cape Ray and Cape North) and Strait of Canso (north of the Canso Causeway), between 21st December and 30th April.



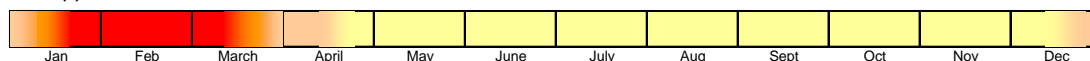
Area 5(c) St. Lawrence River and its tributaries (west of Les Escoumins) between 1st December and 30th April.



Area 5(d) St. Lawrence Seaway.



Area 5(e) Great Lakes.



n.b. Above enhanced risk indicators are based on expected seasonal conditions for this region.

**When Underwriters consider a call to this region, they should be aware that the vessel may need to navigate through more than one of the areas listed above.**

## ■ Conditions Precedent to Liability and/or Express Warranties

The following conditions are available for Underwriters' use:-

- *Breach of Navigating Limit Requirements Clause JH132 (31/10/2003).*

If vessel making Transhipments:-

- *Yokohama or equivalent fenders shall be used, and*
- *No hold harmless shall be given, and*
- *The vessel shall comply with all applicable recommended regulations and/or guidelines for transhipment at sea.*

## ■ Underwriting Considerations

Is vessel Ice classed?

Will vessel employ an ice advisor?

## ■ Primary Hazards

Ice (December to April)

## ■ Additional Information

Area 5a is a large area and covers all of Northern Canadian waters north of 52° 10'N as well as the west coast of Greenland. The exclusion extends northwards as far as the North Pole. The exclusion encompasses *inter alia* Labrador, the Labrador Sea, Davis Strait, Baffin Bay, Baffin Island, Foxe Basin, Hudson Strait, Hudson Bay, as well as the waters of the Arctic Ocean.

Unlike some of the other areas outside of International Navigating Limits there are no major ports within Area 5 (a). However there are several smaller ports which do see regular vessel calls and with which underwriters may not be familiar.

The Navigating Limits working group has useful historic information on these areas which is available for consultation upon request.

One of the main perils of Area 5a is that of icebergs. These will travel from the glaciers of western Greenland into the waters of Labrador and Newfoundland, carried south by the cold Labrador current. The size and number of icebergs varies greatly from year to year. The largest icebergs may weigh in excess of 10 million tonnes, whilst bergy bits and growlers can still pose significant dangers to navigation. The Canadian Ice Service is working on a model to predict iceberg deterioration and drift characteristics.

### *The Gulf of St Lawrence, St Lawrence River, St Lawrence Seaway and the Great Lakes*

Since the opening of the St Lawrence Seaway in 1959, uninterrupted navigation has been possible from the Atlantic Ocean all the way to the port of Duluth, Minnesota at the western end of Lake Superior. This allows vessels to navigate approximately 3,700 kilometers inland, penetrating to the centre of the industrial and agricultural heartland and giving access to some of North America's biggest cities and ports including Québec, Montreal, Toronto, Detroit, Chicago and Duluth.

The four more specifically defined navigable areas are:-

Gulf of St Lawrence (entry via the Cabot Strait)  
St Lawrence River (as far west as Montreal)  
St Lawrence Seaway (connecting Montreal to Lake Ontario via 7 locks)  
Great Lakes (Ontario, Erie, Huron, Michigan, Superior)

Winter navigation in the Gulf of St Lawrence and the St Lawrence River provides challenges to masters that go beyond those normally anticipated in the day to day operation of a vessel. Ice conditions can threaten the safety of the vessel and should therefore be a concern to hull & machinery, cargo and liability underwriters.

Year round navigation in the Great Lakes and through the Seaway system from late April to mid-December also introduces other particular hazards for a ship's master to contend with and these include grounding, contact (with vessels and locks) as well as ice damage.

Over the years, both the Canadian and US operators and users of the St Lawrence and the Great Lakes have adapted their procedures to cope with even the most severe winters. Most ports remain open year round and measures are in place to ensure the safe and uninterrupted flow of marine traffic.

A visit by members of the Institute Warranties Sub Committee in March 2003 to Montreal and Quebec kindly hosted by the St Lawrence Economic Development Council enabled us to see for ourselves the way that new technology combined with many years of seagoing experience allows the Canadians to safely manage vessels in all conditions in their waters.

### *Gulf of St Lawrence*

Ice begins to form in the Gulf of St Lawrence from late November. The ice forms along the coastlines and gradually spreads outwards as the mean sea temperature drops. From mid to late January ice begins to form a hazard to vessels so the first ice-breakers are deployed and recommended routes are issued. In the past, a single recommended route through the Gulf of St Lawrence was issued by the Canadian Coast Guard from its Halifax office. Ice breakers would then assist where required to ensure that the recommended route remained navigable. Ice Centre Quebec took over responsibility for issuing the recommended routes in the winter of 1996/97. At this time new technology was harnessed to provide a far more versatile and reliable service. The satellite RADARSAT-1, launched in November 1995, provides almost real-time digital ice imagery to the Canadian Ice Service. This does far more than simply indicate the presence of ice. The radar is sensitive to differences in the concentration, type, age and thickness of the ice. This means that the Ice Centre can now continually update the recommended route to reflect the easiest passage through the ice. Regular ice bulletins are issued showing the current ice conditions and recommended route through the Gulf of St Lawrence. The scheduled launch of RADARSAT-2 with enhanced resolution should further improve the accuracy of the recommended routes.

Ice development is at its most severe by mid to late February by which time the whole of the Gulf of St Lawrence up to the Cabot Strait will be covered in a typical year. The Strait of Belle Isle (which is a useful alternative entry point to the Gulf of St Lawrence for vessels arriving from Europe) is usually completely covered by the end of December. It remains covered for an average of 140 days each year.

Satellite imagery shows that even in the mid-winter period there are marked variations in the thickness and extent of ice coverage. The south coast of Anticosti Island tends to have thinner ice than elsewhere and most of the recommended routes will take advantage of this. The most severe ice is often found in a triangle between Cape Breton Island, Prince Edward Island and the Magdalen Islands.

Maximum ice coverage usually continues until mid March when longer daylight hours and higher mean temperatures mark the start of the spring break-up.

In an average year ice breaks up quickly leaving large expanses of open water by the end of March, although higher concentrations of ice are still found well into April. The last of the ice remains until May and sometimes early June, especially in the area north of Cape Breton Island and in the Strait of Belle Isle. The Gulf of St Lawrence does not have 'old ice' (ice that has survived one summer's thaw). So each year the pattern of ice formation and melt repeats itself afresh. The general pattern of ice development remains fairly consistent from one year to the next, however, there are huge variations in severity between 'mild' winters and 'severe' winters. The winter of 2002/03 was the most severe since 1993/94. However 1993/94 was the fourth year in a row of worse than average ice conditions in the early nineties.

In view of annual differences in the ice conditions in the Gulf of St Lawrence, checking up-to-date ice information will assist with the assessment of the risk and real time information is available from a number of sources (listed below).

### *St Lawrence River*

Winter conditions in the St Lawrence River officially begin when six consecutive readings of 2.5°C are taken (8 hours apart) from a buoy near Quebec City. At this point the coast guard starts to remove the summer navigation buoys and night-time navigation is suspended. This tends to happen in late November / early December of each year. The earliest freeze-ups are recorded between Trois Rivières and Quebec. The first freeze-up at Montreal usually occurs later than at Quebec.

The first ice to form is frazil ice, which is ice that is only weakly bound together and cannot do any physical damage to the hull of a ship. It can, however, and often does, cause problems when it is taken in through the water intakes for engine and machinery cooling and can cause blockage of the sea inlet boxes. This can cause the engines to over-heat and shut down with consequent problems associated with loss of main engine power. Filters are required to prevent this or vessels need to switch to internal cooling water re-circulation if they have this capability.

The minimum thickness of ice required to cause damage to the hull of a vessel is about 10 centimetres, this happens two or three weeks after the first appearance of ice.

The Canadian Coast Guard deploys ice-breakers throughout the St Lawrence River and the Gulf of St Lawrence.

A channel down the middle of the St Lawrence River is kept relatively free of ice by the use of ice booms. These booms are placed at the outer limit of the channel and maintain full ice cover on either side of the channel. This slows down the formation of new ice within the channel by reducing the overall surface area of water exposed to the cold air. It also accelerates the current in the channel which helps prevent blockages and ice-jams.

Warmer air temperatures in the spring cause the ice to melt and usually from about mid-March the river clears from Montreal downstream as the current pushes the decaying ice flows toward the Gulf. These ice flows can still pose hazards to navigation and ice breakers remain on hand to deal with blockages.

### ***St Lawrence Seaway***

The Seaway consists of 7 locks between Montreal and Lake Ontario. There are a further 8 locks in the Welland Canal which connects Lake Ontario with Lake Erie.

The dimensions of the locks dictate the size of vessels that can enter the Great Lakes. In March 2004 the operating draft of the Seaway was increased to 26.5feet (an increase of 3 inches over 2003), allowing slightly larger vessels access to the Lakes. The current maximum allowable dimensions are 740 feet in length and 78 feet in breadth. Contact with locks is a year round hazard and vessels regularly trading through the seaway typically exhibit signs of contact with the approaches and sides of the locks. Most of these contacts will be minor and will not require steel renewal. The lock walls themselves are permanently protected with timber (typically oak) fendering units. High energy contact with lock structures can still and do still occur and these can sometimes exceed typical modern deductibles. The St Lawrence Seaway Authority maintains a "Vessel Integrity Measurement" programme which captures data on estimated repair costs of all damages to vessels occurring within the St Lawrence Seaway.

The maximum breadth of vessel permitted in the Seaway was increased from 76 feet to 78 feet in the mid-nineties. In the first harsh winter since their introduction several 78 foot beam vessels had ice contact problems in the locks. This was because there was simply not enough space for the ships and ice to be in the locks at the same time. Measures are now in place to completely empty the lock chambers of ice prior to allowing a 78 foot beam vessel to enter.

A year round concern for vessels navigating in the Seaway is loss of main engine power. If a vessel experienced main engine breakdown and released a bow anchor to stop the vessel the current from the Lakes out towards Montreal could swing the vessel such that it ended up crossways, or possibly jammed in a narrow channel. All inland vessels are fitted with stern anchors to deal with this eventuality - however not all ocean going vessels will be.

The Seaway system closes down for the winter period. The actual dates vary according to the conditions but it will typically be around Christmas time with re-opening not until the end of March (i.e. the following Spring).

Due to the closure of the Seaway ice damage is not usually a major concern, although there is still a risk to vessels in the weeks immediately before it closes and immediately after re-opening. The St Lawrence Seaway Authority imposes a power to length ratio (Total Main Engine Output (Kw)/Length overall (m)) to ensure that under-powered vessels do not operate in ice conditions.

There are various measures in place to ensure safe operations in the locks in periods when ice may be present, these include air curtains (keeps ice away from lock gates), air bubblers on gates, ice flushing valves (to flush ice out from the lock chamber) and gate heating. Specialist tugs may also be used to deal with ice in the locks.

The idea of keeping the St Lawrence Seaway open throughout the winter is periodically discussed. The St Lawrence Seaway Authority believes it has the expertise to do it. Detailed cost / benefit analysis would need to be commissioned before this would ever happen.

### ***Great Lakes***

The Great Lakes present a unique navigational environment and the closure of the St Lawrence Seaway limits winter navigation within the Great Lakes to those vessels that are year-round lakere.

Closure of the St Lawrence Seaway tends to coincide with the first appearance of heavy ice in the Great Lakes. The first ice is usually found in the shallow waterways connecting the five Lakes and in a particularly harsh winter there may be ice cover in some areas of the Lakes by the second week in December.

### ***General Hazards and risk management considerations***

Ice Pilots

Not in breach of St Lawrence Seaway Power to Length Ratio requirements

Sea Suctions – frazil ice

Cooling water re-circulation

Recommended routes – advisory only

Ice Classification (types of)

Bow thrusters – ease of navigation into and out of locks.

High cost of repairs in North America

Collision risk in convoy (2003 case details from LSA)

Stern Anchors – to bring vessel to controlled stop in confined channel

### *Ice Terms*

<b>Bergy bit</b>	Piece of glacial (iceberg) ice showing from 1m to less than 5m above sea-level with an area of about 100-300 sq.m, and length of 5-15 m.
<b>Calving</b>	The breaking away of a mass of ice from an ice wall, ice front, or iceberg.
<b>Close Ice</b>	Floating ice of 7/10 to 8/10 concentration, composed of floes mostly in contact with one another.
<b>First-year ice</b>	Sea ice of not more than one winter's growth, 30cm to 2m thick.
<b>Growler</b>	Small piece of glacial (iceberg) ice showing less than 1m above sea-level, with an area of about 20 sq.m, and length of less than 5m.
<b>Old ice</b>	Sea ice which has survived at least one summer's melt.

### *Ice Maps and other Information*

#### **Canadian Coast Guard**

Of particular interest is their 1999 publication "Ice Navigation in Canadian Waters"

[http://www.ccg-gcc.gc.ca/ice-gla/publications\\_e.htm](http://www.ccg-gcc.gc.ca/ice-gla/publications_e.htm)

#### **National Ice Centre**

<http://www.natice.noaa.gov>

#### **30 Day Outlook:**

<http://ice-glaces.ec.gc.ca/app/WsvPrdCanOry.cfm?subID=2008&Lang=eng>

#### **Ice Hazard Bulletins:**

<http://ice-glaces.ec.gc.ca/app/WsvPrdCanOry.cfm?subID=2006&Lang=eng>

#### **Daily Ice Charts (Gulf of St. Lawrence, Great Lakes, Newfoundland, Davis Strait etc.):**

<http://ice-glaces.ec.gc.ca/app/WsvPrdCanOry.cfm?subID=2001&Lang=eng>

#### **Daily Ice Charts (St Lawrence River):**

<http://ice-glaces.ec.gc.ca/app/WsvPrdCanOry.cfm?subID=2005&Lang=eng>

Additional information, including prevailing conditions, for this region is available from members of the Joint Hull Committee's Navigating Limits Working Group
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