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# Seasonal Summary

Eastern Canada  
Winter 2014-2015

By



Canadian Ice Service  
Le service canadien des glaces

## Summary for the East Coast

The East Coast winter 2014-2015 season was separated by two distinct temperature regimes. From November to mid-February, surface air temperatures across the region were normal in the Gulf of St. Lawrence and Newfoundland waters and below normal over the Southern Labrador Coast with respect to the 1981 to 2010 climatology. An anomalous wind pattern and storm track was also identified during the season, as frequent storms and persistent southeasterly winds affected the region. This led to normal to slightly below normal ice development across the Gulf and Newfoundland areas, whereas the Southern Labrador Coast experienced normal to slightly above normal ice growth during this first period. After mid-February, the East Coast in its entirety was generally below the climatological normal with respect to air temperature. This led to above normal ice development in the region for the remainder of the season.

After a period of slower ice growth season across the Gulf of St. Lawrence and in Newfoundland waters due to normal surface air temperatures, the onset of colder than normal air temperatures after mid-February led to significant development of above normal ice growth across Cabot Strait and northeast of Newfoundland. By mid-March 2015, Cabot Strait and vicinity experienced ice coverages over twice the median value making shipping in the region particularly difficult. Over East Newfoundland waters, the ice coverages from mid-March were nearly as impressive as they approached double the median climatological values for the region.

In the Southern Labrador Sea, the below normal air temperatures supported near normal ice growth through the winter season until early March 2015 when deepening of the cold air temperature anomaly led to slightly above normal ice growth for the region for the second half of the season. Maximum ice coverage was reached by mid-March before steadily deteriorating through the spring.

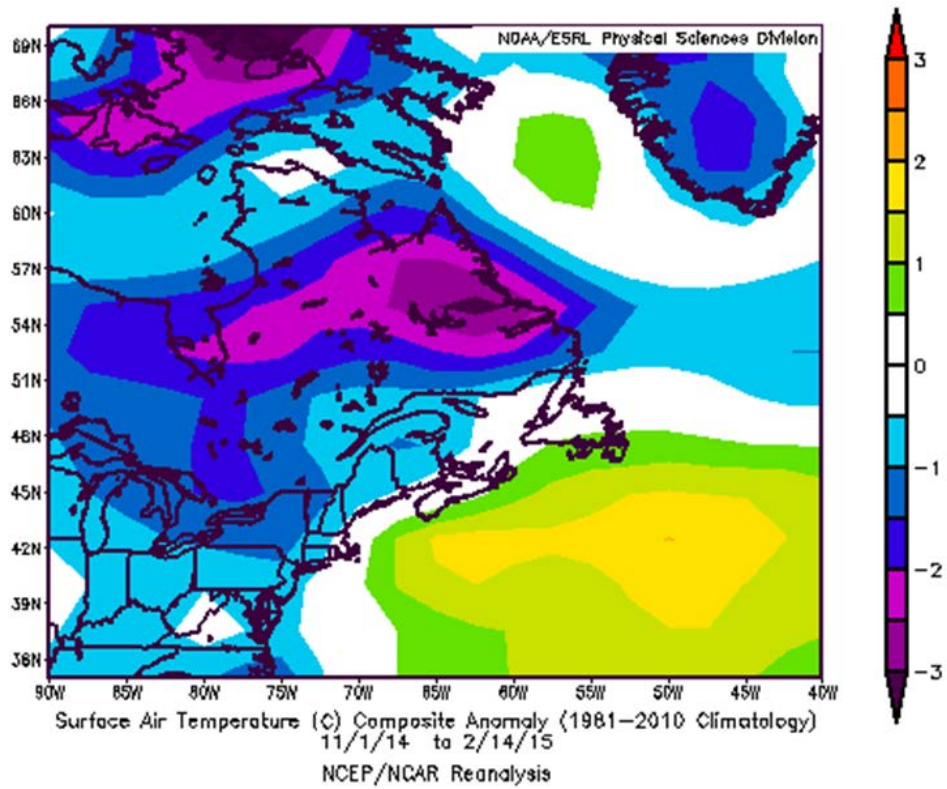


Figure 1: Surface Air Temperature Anomaly November 2014 to mid-February 2015.

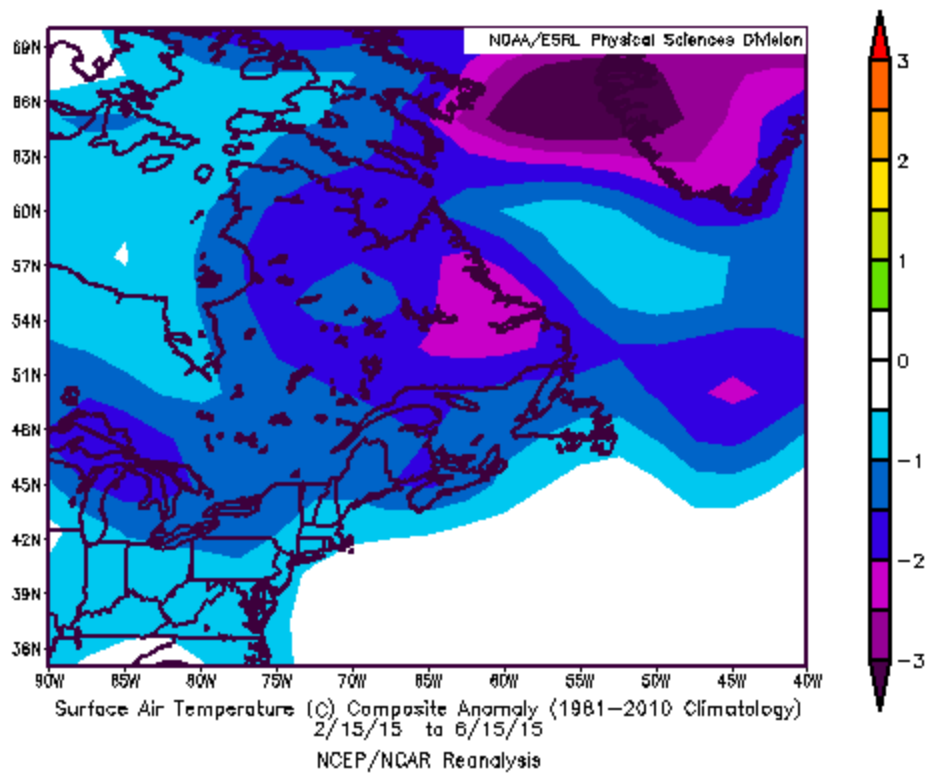


Figure 2: Surface Air Temperature Anomaly mid-February 2015 to mid-June 2015.

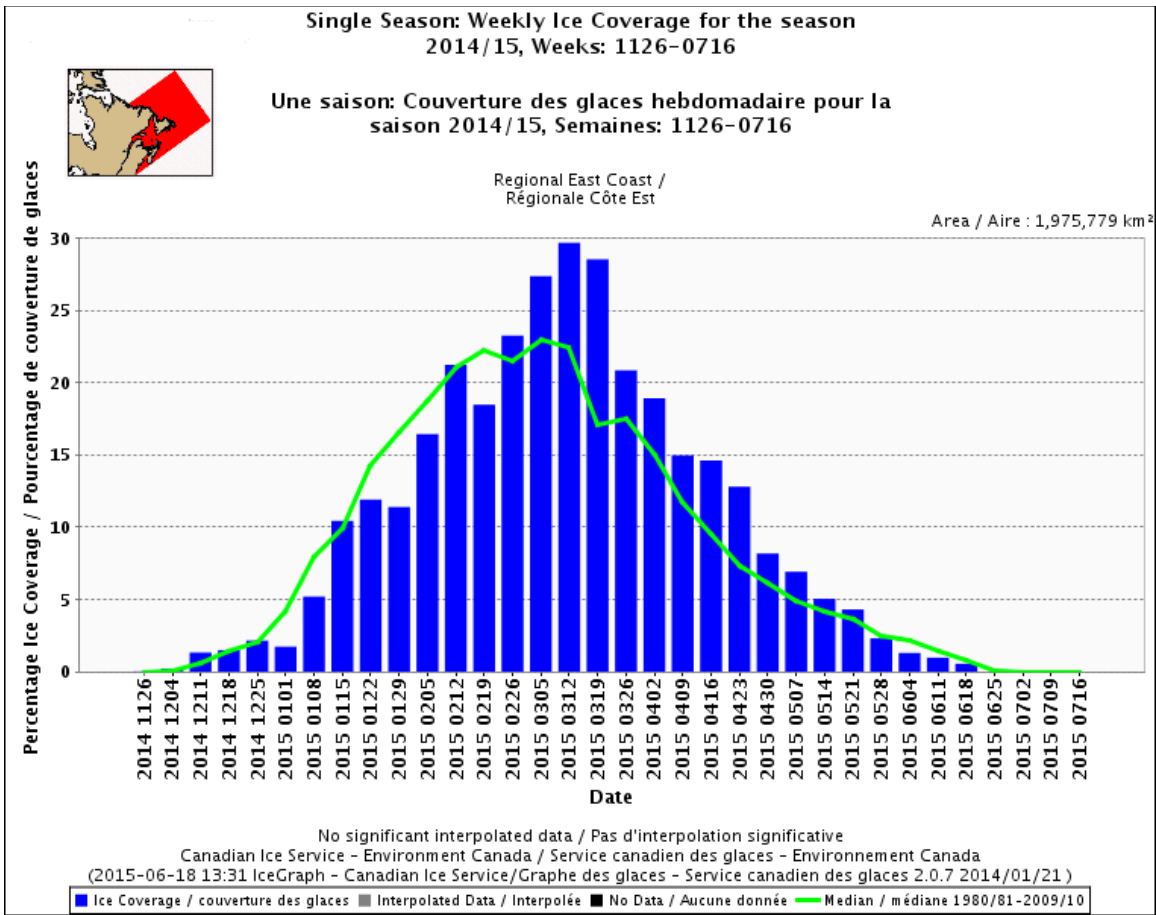


Figure 3: East Coast Weekly Ice Coverage for the 2014-15 winter season.

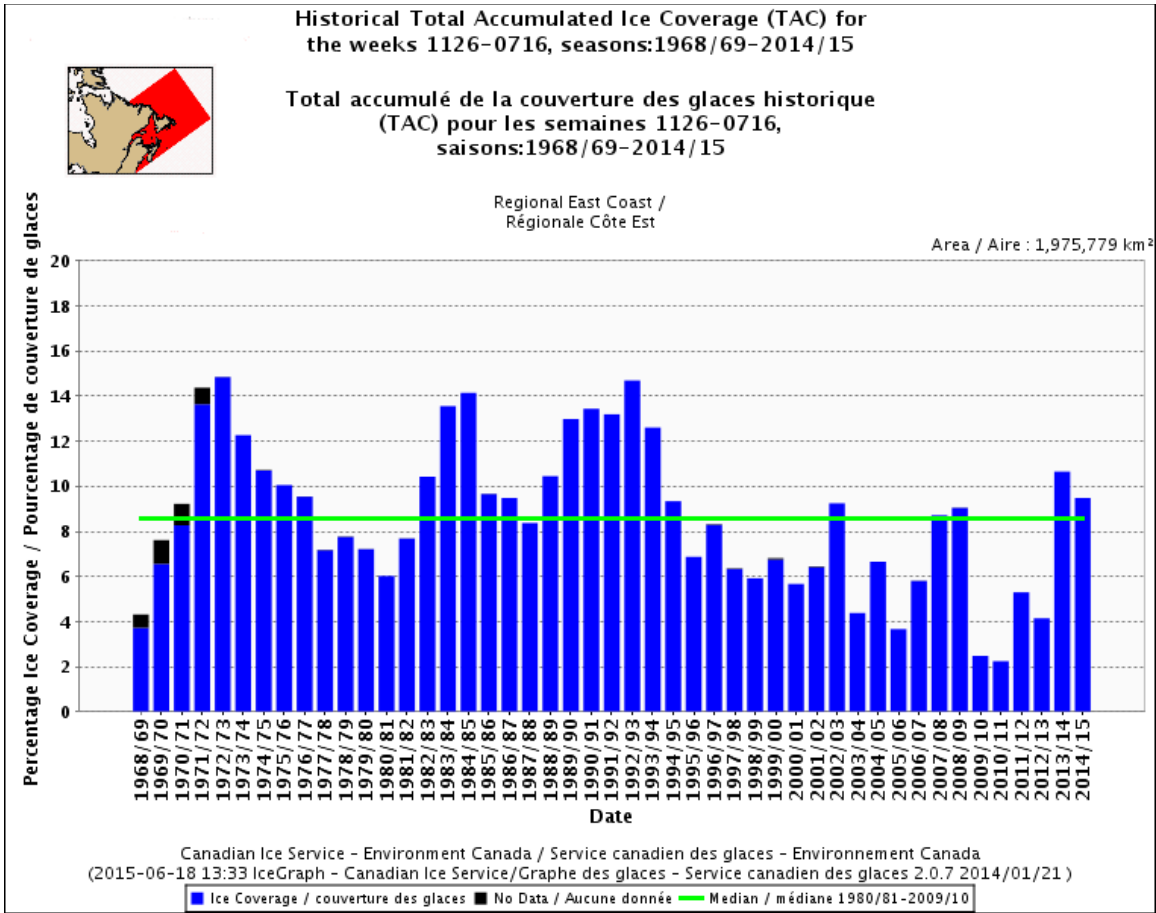


Figure 4: East Coast Historical Total Accumulated Ice Coverage by season, 1968-2015.

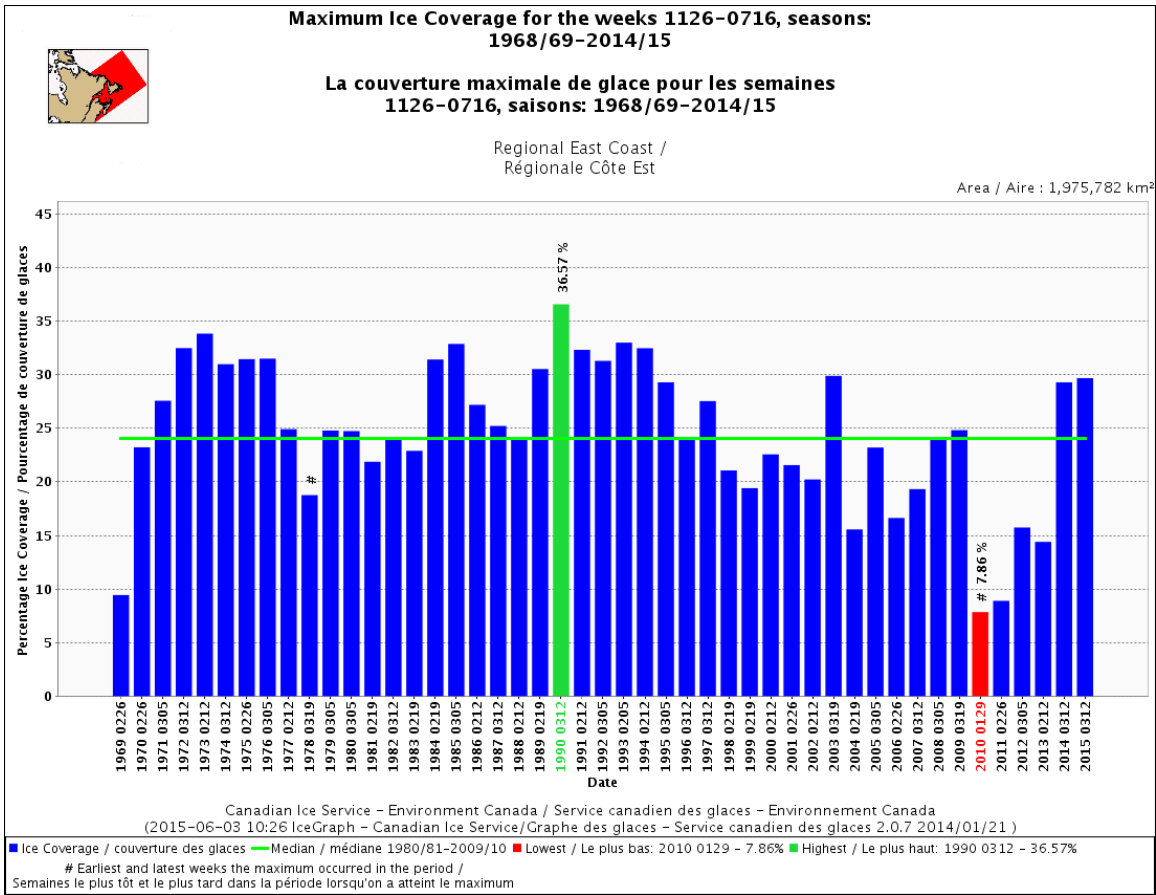


Figure 5: East Coast Historical Maximum Ice Coverage by season, 1968-2015.

## Gulf of St Lawrence

### **2014-2015 Season temperatures and Weather: November to the third week of June.**

For the period from November to mid-February, surface air temperatures were near normal across the Gulf of St. Lawrence. An anomalous wind pattern and storm track resulted in more frequent southeasterly winds across the Gulf. These anomalous winds slowed the development of ice through February, until colder temperatures in mid-February were established for the remainder of the winter season due to an eastward shift in the storm track. These colder than normal temperatures led to a rapid recovery of ice coverage to normal levels by the end of February, and then the eventual above normal ice coverage values that were experienced across the region for the rest of the season.

In a season marked by frequent storms and extreme accumulations of snow, the impact of these disturbances on the ice coverage was to lead to

significant destruction and redistribution events due to strong winds across the Gulf. The persistent storm track ushered multiple low pressure systems across the region beginning in late January and continued through March, reshaping the ice coverage substantially with each passing storm.

#### **December ice conditions:**

The first ice appeared in Chaleur Bay and along the north shore in Québec near Harrington Harbour. By the end of the first week, ice was growing in the estuary and near Sept-Îles. In the second week new and grey ice appeared along the New Brunswick and Prince Edward Island coasts, but some destruction occurred by mid-month that limited the ice to sheltered bays in the Gulf. Stagnant conditions prevailed through the remainder of the month for the region. Ice growth was relatively normal for the December period in the Gulf despite the variability during the month.

#### **January ice conditions:**

Slow ice growth continued in the first week keeping the ice coverage below normal climatological values. Fast ice was established in sections of Chaleur Bay and in sheltered bays along the New Brunswick coast, and new and grey ice was present around Îles de la Madeleine. A surge in ice development started in the second week, particularly northeast of Prince Edward Island. Grey ice began to develop as well over the southern section of the estuary, and new ice grew in the extreme eastern section of the Bay of Fundy.

But during the third week of January, a significant destruction event occurred across the Gulf and setback the ice development to levels well below normal. Ice coverage did not recover substantially over the course of the fourth week, but grey-white ice did remain in the Northumberland Strait, and along the Gaspé Peninsula and the northern shore of Prince Edward Island. Traces of first-year ice did develop in the southern portion of Chaleur Bay and along the northern Prince Edward Island shore, but ice coverage surrounding Anticosti Island and in the central Gulf remained well below climate normals.

#### **February ice conditions:**

Ice coverage across the Gulf was normal to below normal until mid-month, with the northeast Gulf significantly below the climate normal. Over the first week grey-white ice expanded from the mouth of the estuary and across the central Gulf west of the Îles de la Madeleine. Ice began to push into Cabot Strait as well by the end of the first week. Thin first-year was the dominant ice type east of Prince Edward Island by the second week, and thin first-year ice was present throughout the estuary, Northumberland Strait and surrounding Anticosti Island.

After mid-month, another destruction event reduced the ice coverage in the Gulf, particularly over the central Gulf and along the northern Québec shore.



But colder temperatures over the second half of the month permitted a quick recovery of the lost ice, with only the northeastern Gulf remaining below normal. Ice extended into the Cabot Strait beyond the normal climatic range, with grey-white ice first present in the strait by the third week, thickening to thin first-year by month end. Thin first-year ice was predominant across the central Gulf and near Anticosti Island, which was approximately one week ahead of climatological normals.

### **March ice conditions:**

With the onset of colder than normal air temperatures in the previous month, ice coverages ran above the climate normal for the whole month. Medium first-year ice developed in the first week, appearing in the Northumberland Strait and along the western shore of Cape Breton. Grey-white ice along the western Newfoundland coast thickened in the second week to predominately thin first-year ice. Additionally, medium first-year ice was the predominant ice type around northern Cape Breton and thick first-year ice was present before mid-month. Ice coverage peaked in the second week of March at over 51%, and the sea ice extended to nearly 44°N by the middle of the month.

During the third week, a substantial winter storm passed over the Gulf and strong winds associated with the system destroyed a large quantity of ice and pushed ice offshore from the western Newfoundland coast. Ice in the estuary and over the northern portion of the Gulf was reduced in extent and concentration, and the band of ice in Cabot Strait narrowed significantly. A final March storm near the end of the month further diminished the ice in the Gulf, as the remaining ice in the estuary was rendered into strips and patches and large areas of open water developed in the central and northeast Gulf. The ice pack along the western Newfoundland coast was compressed and thickened, with medium and thick first-year ice now present. Even with the destruction, ice coverage was still above normal in the central Gulf, the waters surrounding Prince Edward Island and in Cabot Strait at the end of the month.

### **April – May ice conditions:**

Early in April, the estuary was free of sea ice, approximately normal according to the climatology for the region. Ice diminished slowly across the southern portion of the Gulf, in the Northumberland Strait and Cabot Strait. Throughout April, the ice coverage was above the climatological normal and remained densely packed over the southern Gulf. Ice along the western Newfoundland coast melted steadily through the month until it receded to Pointe Riche, and a trace of old ice was now present in the Strait of Belle Isle by the end of the month.

Warming in early May drove rapid ice reductions in the remaining ice. Fast ice breakup commenced in Chaleur Bay and in isolated bays along the Prince Edward Island and New Brunswick coasts. By the second week, isolated

strips and patches of first-year ice was all that remained near Cape Breton Island. The last ice trapped in the Îles de la Madeleine melted at the end of the second week of May.

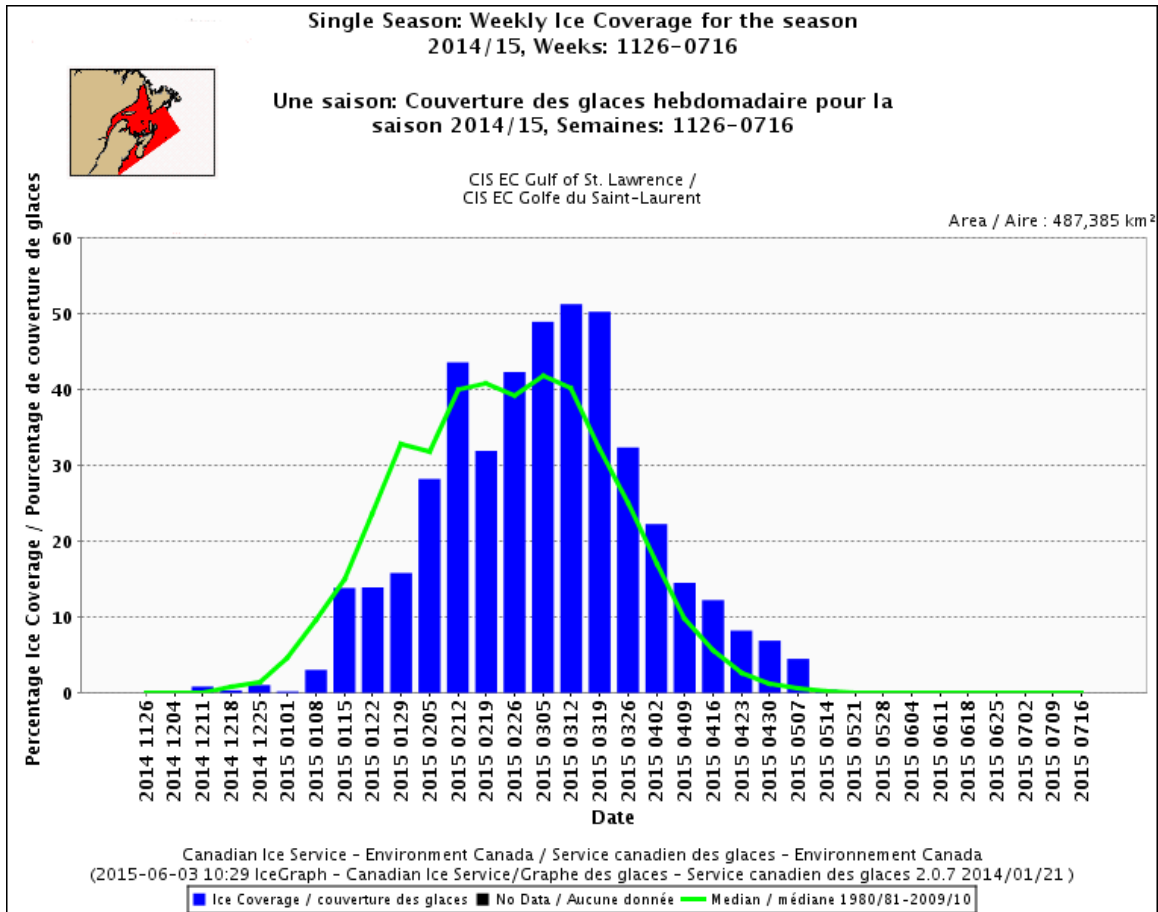


Figure 6: Weekly Ice Coverage for the 2014-2015 season in the Gulf of St. Lawrence.

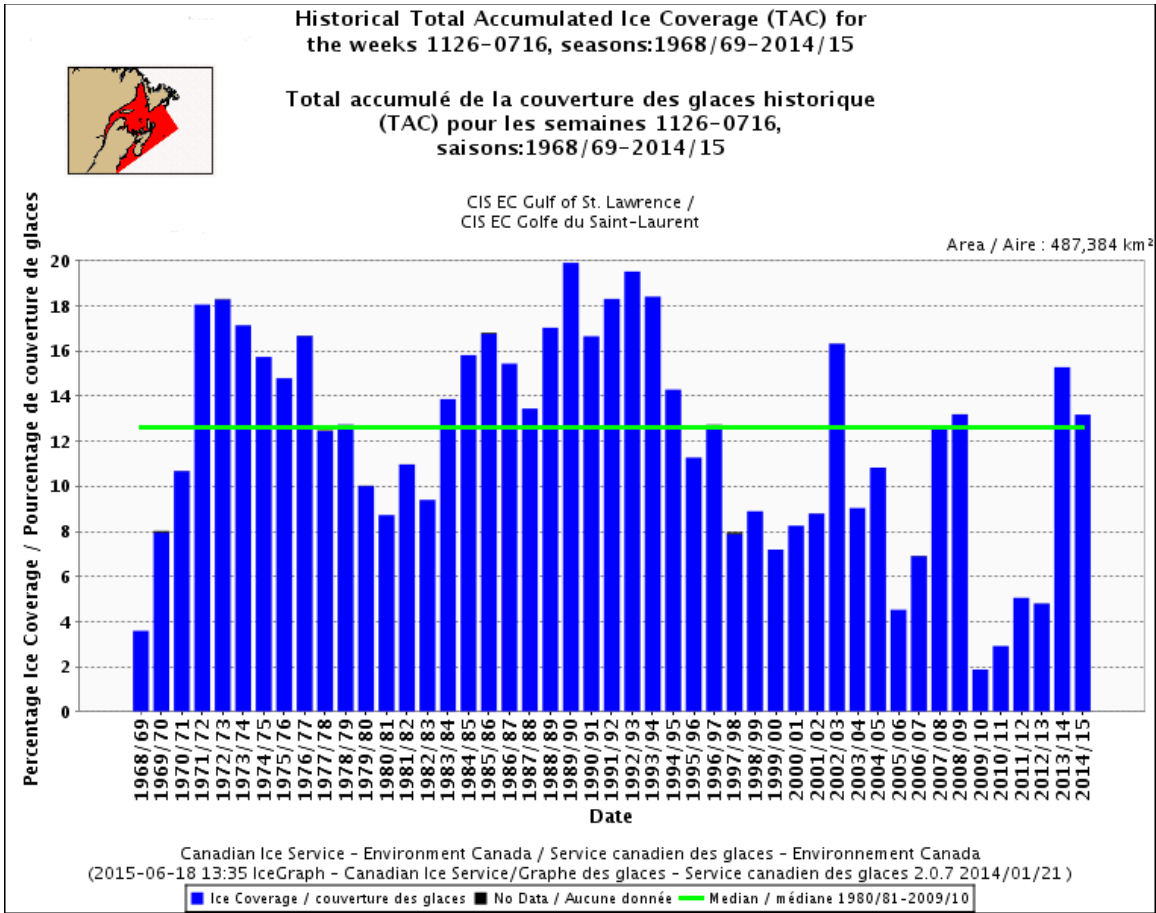


Figure 7: Historical Total Accumulated Ice Coverage for the Gulf of St. Lawrence by season, 1968-2015.

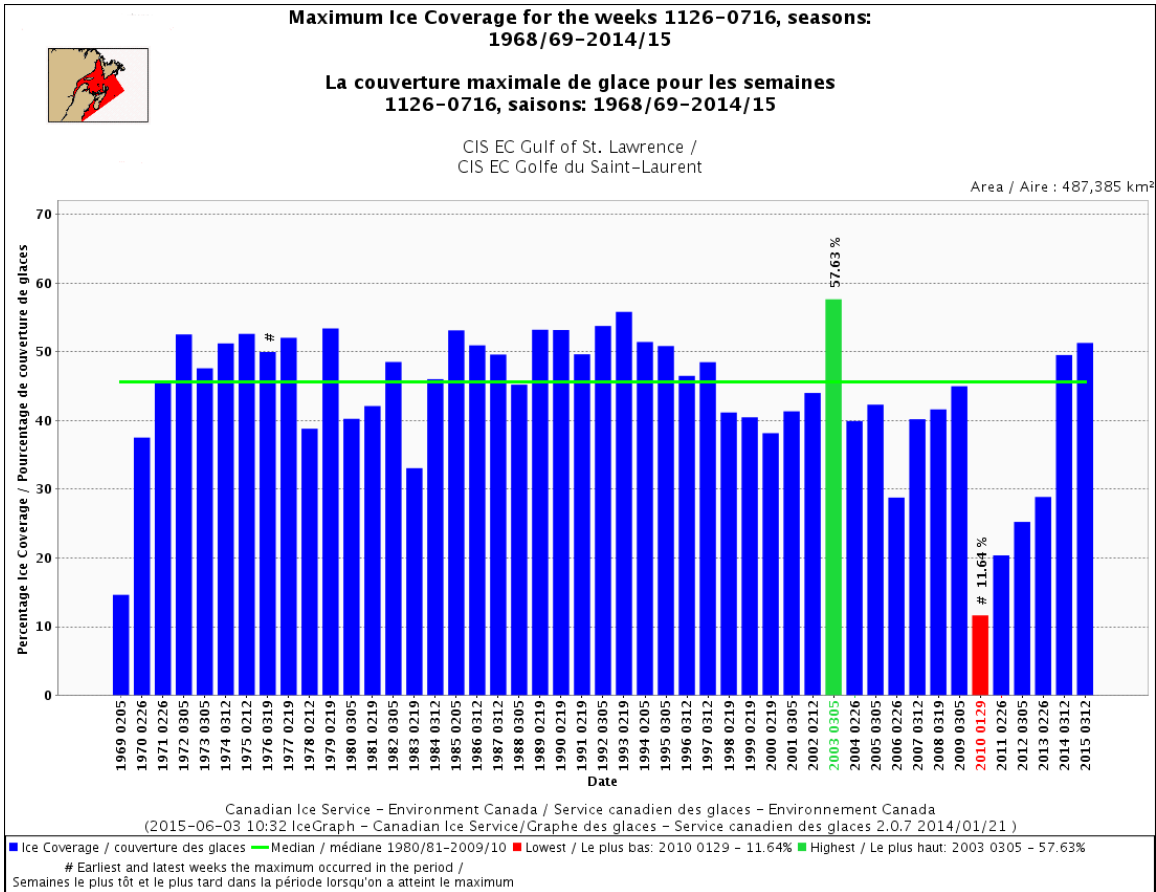


Figure 8: Maximum Ice Coverage in the Gulf of St. Lawrence by season, 1968-2015.

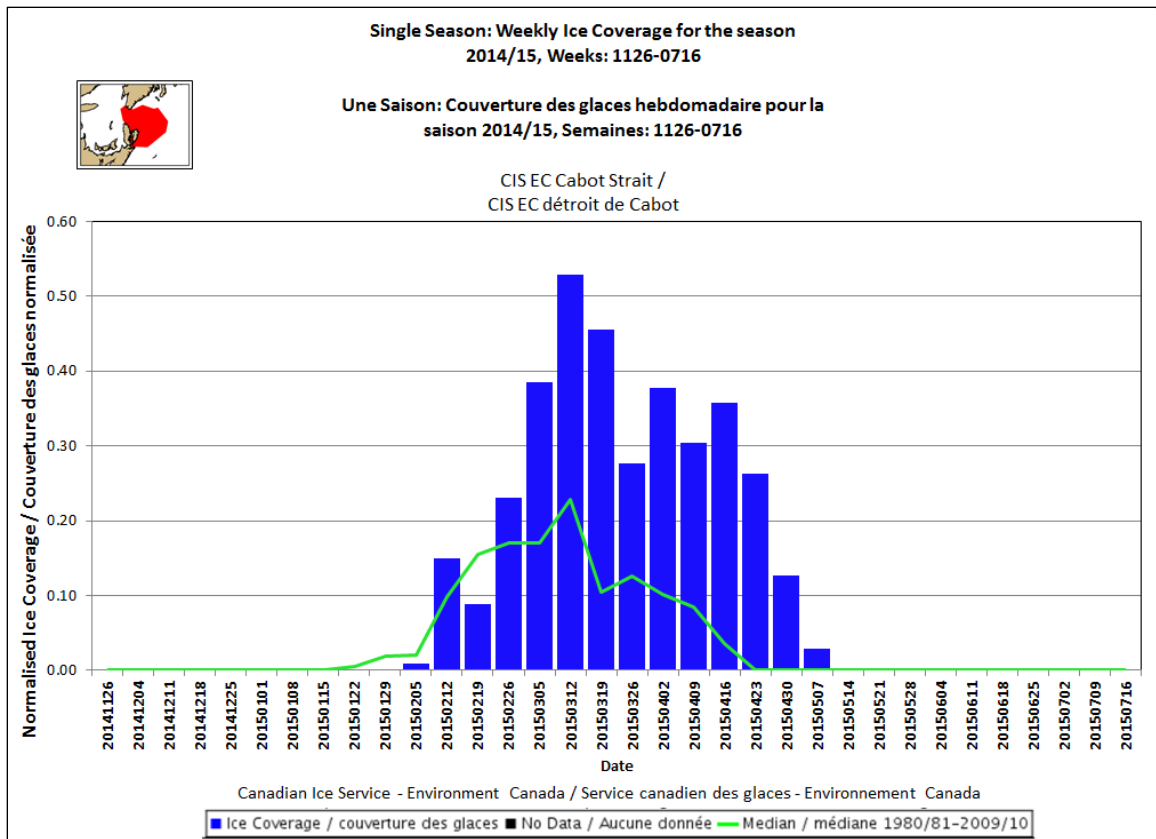


Figure 9: Single Season Weekly Ice Coverage for Cabot Strait and Approaches, winter 2014-15.

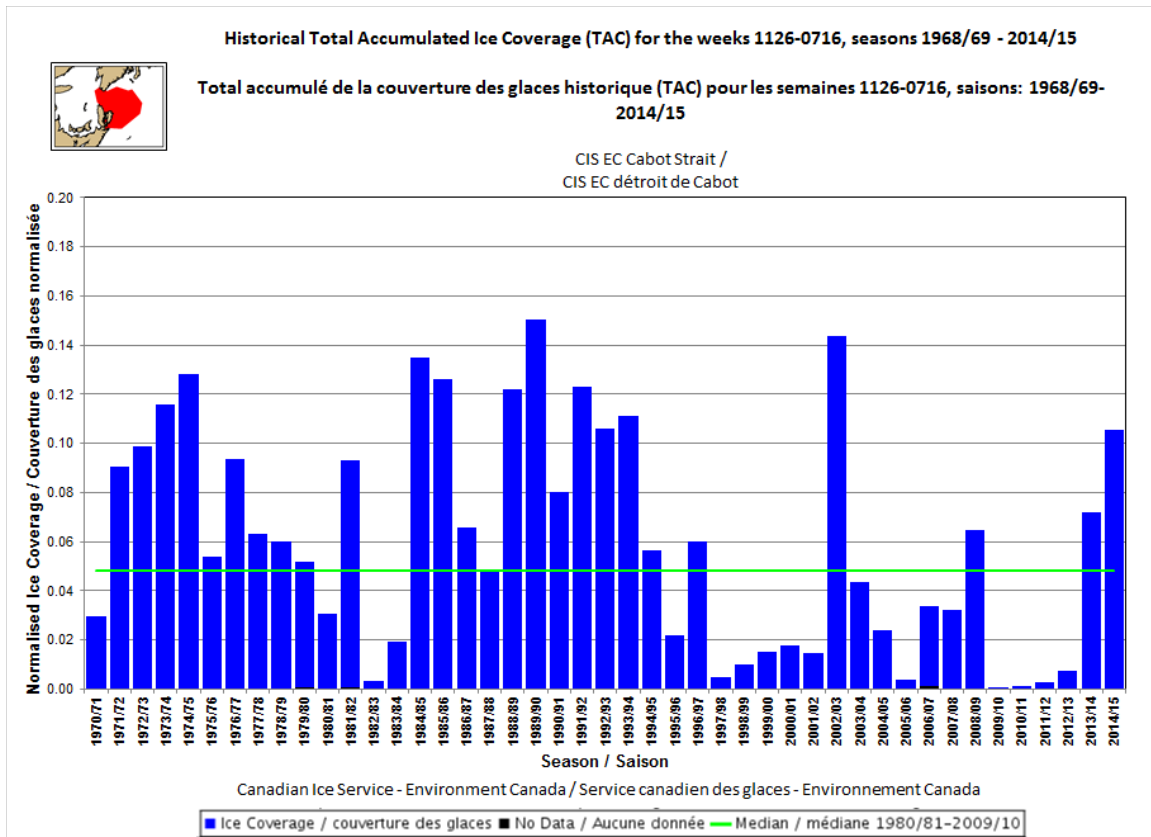


Figure 10: Cabot Strait Historical Total Accumulated Ice Coverage for 1968-2015 winter seasons.

## Newfoundland and Labrador waters

### **2014-2015 Season temperatures and Weather: November to the third week of June**

For the period from November to mid-February, surface air temperatures were near normal across Newfoundland waters. As was the case in the Gulf of St. Lawrence, the anomalous southeasterly winds and frequent storms tracking over the region slowed the development of ice through February, until colder temperatures in mid-February were established for the remainder of the winter season. These colder than normal temperatures lead to a rapid recovery of ice coverage to normal levels by the end of February, and then the eventual above normal ice coverage values that were experienced across the region for the rest of the season.

Across Labrador waters, the surface air temperatures were below normal throughout the season in general. This cold regime lead to normal ice coverages

until early March, when coverages slightly exceeded the 1980-2010 climatological normal.

### **November ice conditions:**

New ice began forming in Lake Melville in the third week, followed by ice development along the southern and mid-Labrador coasts in the fourth week. Ice in the extreme western end of Lake Melville thickened to predominantly grey by the end of the month. New ice also formed in isolated bays along the extreme northern coast of Newfoundland at the end of November.

### **December ice conditions:**

By mid-month, new and grey ice along the mid-Labrador coast and near Groswater Bay had extended to 30 nautical miles from the coast. By the third week, this ice had thickened to predominately grey with some grey-white ice present. Lake Melville consolidated with predominantly grey-white ice and some thin first-year ice present in the fourth week. Near month end, new, grey and grey-white ice began to cover the Strait of Belle Isle.

### **January ice conditions:**

Ice concentrations rapidly increased along the Labrador Coast in the first week, and the extent now approached a distance of up to 80 nautical miles from the coast. Ice drifted further southward toward the northeast coast of Newfoundland and westward into the Strait of Belle Isle. New ice formed in Notre Dame Bay from Fogo Island to Botwood as well, and then progressed eastward into Bonavista Bay by the end of the first week. Near the Port au Port Peninsula, new ice developed in sheltered bays at the end of the week.

The ice coverage underwent a large southeastward expansion in the second week, as the sea ice extended up to 100 nautical miles from the south Labrador coast. Predominantly grey-white ice along the Labrador coast then began to advance to the thin first-year stage, and by month end the sea ice was approaching White Bay from the north and had covered the Strait of Belle Isle completely with grey and grey-white ice.

### **February - March – April ice conditions:**

Grey-white ice became the predominant ice type in the Strait of Belle Isle and over the northeastern Newfoundland waters by the end of the first week of February. Predominantly thin first-year ice with a trace of medium first-year ice moved over Groswater Bay as well. During the second week of February, the sea ice expanded to cover White Bay and Notre Dame Bay and the ice edge was extending progressively further southeastward with each day. Predominantly thin first-year ice now covered the eastern half of the Strait of Belle Isle. By the end

of February the ice edge extended up to 140 nautical miles east of Bonavista to about 48°N. Medium first-year ice was becoming the predominant ice type in Groswater Bay and in the consolidated ice covering Lake Melville during the fourth week of February as well.

In early March, the first trace of old ice was identified off the mid-Labrador coast and moved steadily southward in the Labrador Current to a position near Groswater Bay by month end. The area of predominant medium first-year ice grew from the Strait of Belle Isle in the first week of March to approximately 30 nautical miles northeast of Bonavista at the end of the month. The extension of sea ice in the third week reached 46°N 47°W before receding northwards. Bergy water areas opened in White and Notre Dame Bays in the fourth week as the main pack moved further east. Maximum ice coverage values were established during the month of March for East Newfoundland waters and the Southern Labrador Sea. The Southern Labrador Sea achieved its maximum ice coverage by the second week of March at over 27%, slightly above the climate normal, whereas the East Newfoundland waters reached nearly 20% coverage by the third week, roughly double the median value from the 1981-2010 climatology of 11%.

The sea ice in Northeast Newfoundland waters receded through the month of April. The pack ice remained approximately 30 nautical miles offshore until easterly winds pushed the sea ice back onshore, particularly east of Fogo Island and back into White Bay. The area of fast ice in Notre Dame Bay broke up at the end of the month and the maximum southeastern extension of ice diminished to a position near 48°N 50°W.

### **May to the third week of June ice conditions:**

The trace of old ice spread into White Bay and the main ice pack north of Notre Dame Bay by the end of the first week of May. The final ice in the Strait of Belle Isle and along the western Newfoundland coast melted in the third week of May. Ice in White Bay, Notre Dame Bay and Bonavista Bay melted by the fourth week and the remaining ice in the northeast Newfoundland waters was confined to an area 40 nautical miles north of the Baie Verte Peninsula. Consolidated ice in Lake Melville fractured during the third week of May and another fast ice region near Cartwright became mobile in the fourth week.

The last ice over northeast Newfoundland waters melted in the first week of June and ice retreated to a position near Groswater Bay. Lake Melville cleared completely near the end of the first week as well. Ice in Groswater Bay completely melted during the second week of June and the ice pack was located north of the entrance to Lake Melville.



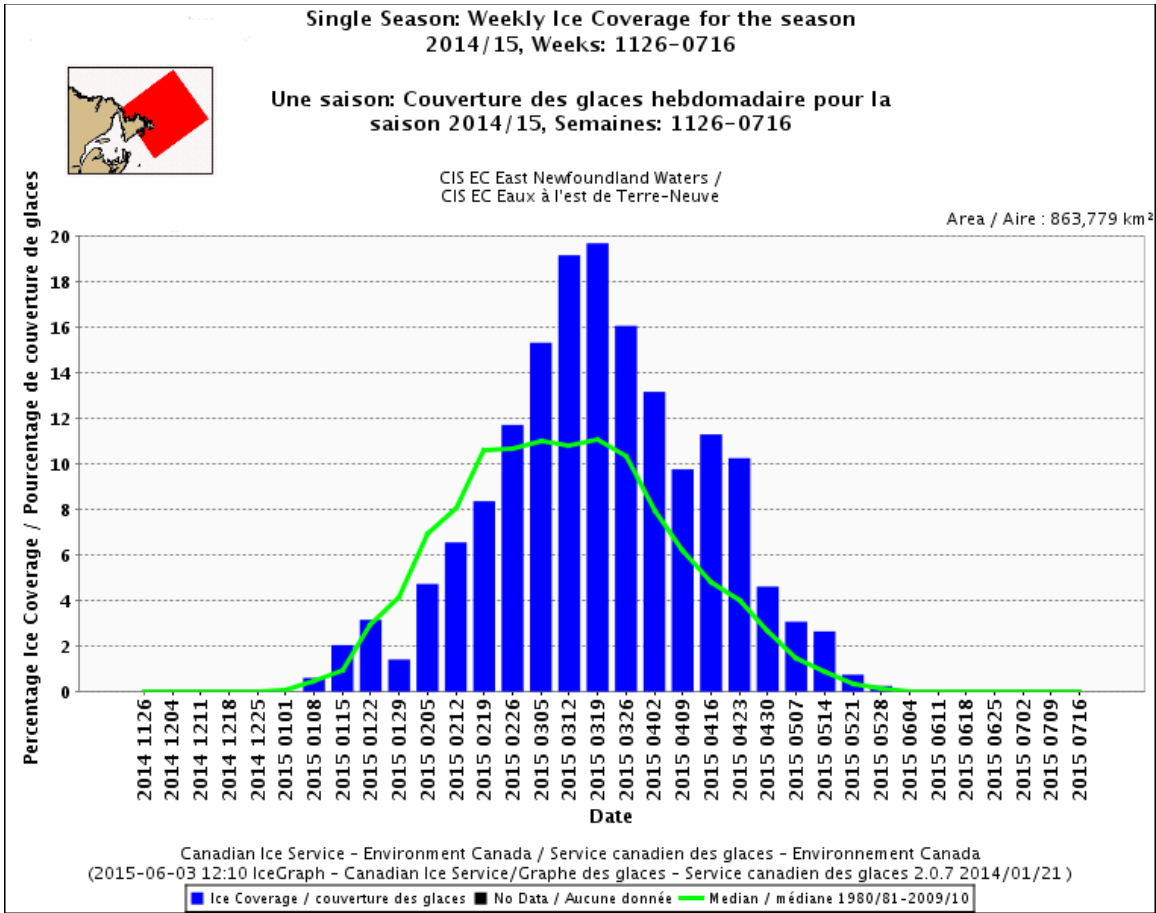


Figure 11: Weekly Ice Coverage for the 2014-2015 season in East Newfoundland Waters.

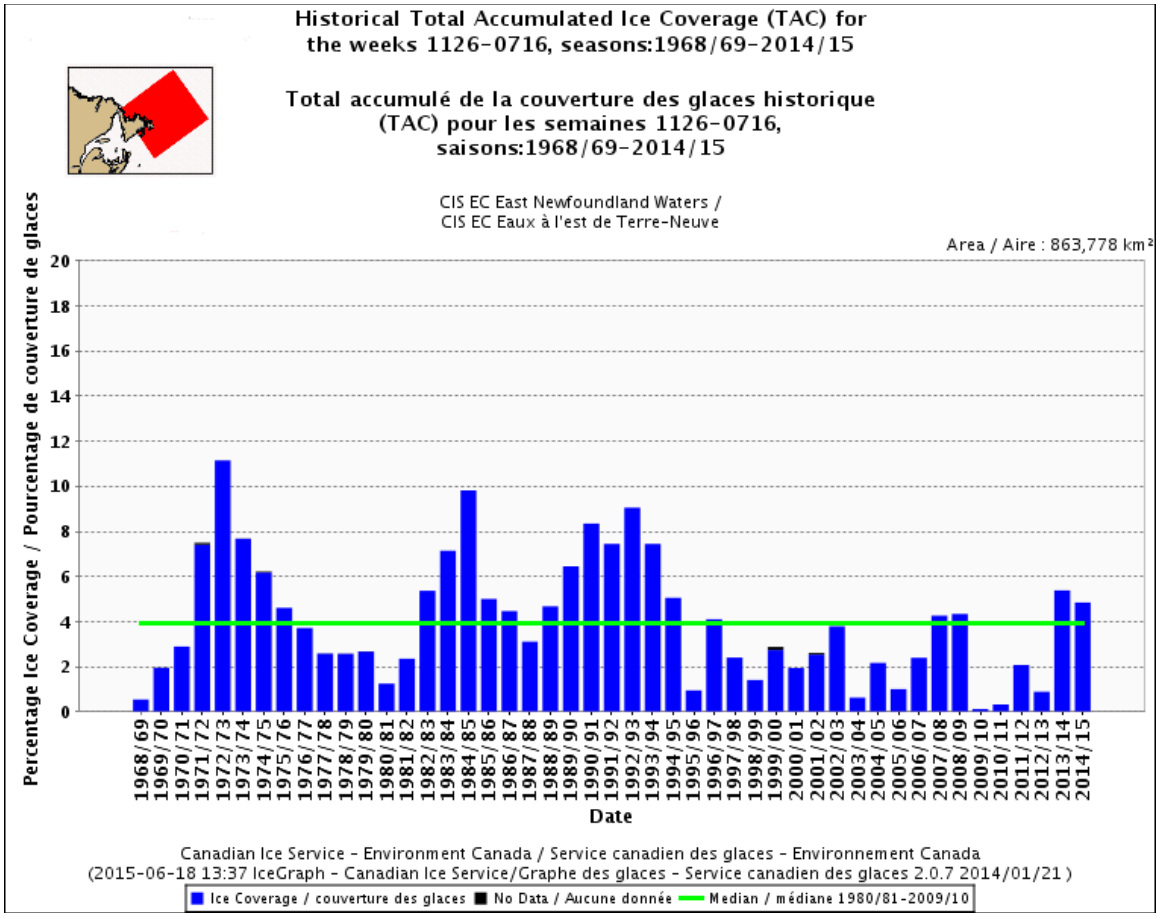


Figure 12: Historical Total Accumulated Ice Coverage in East Newfoundland Waters by season, 1968-2015.

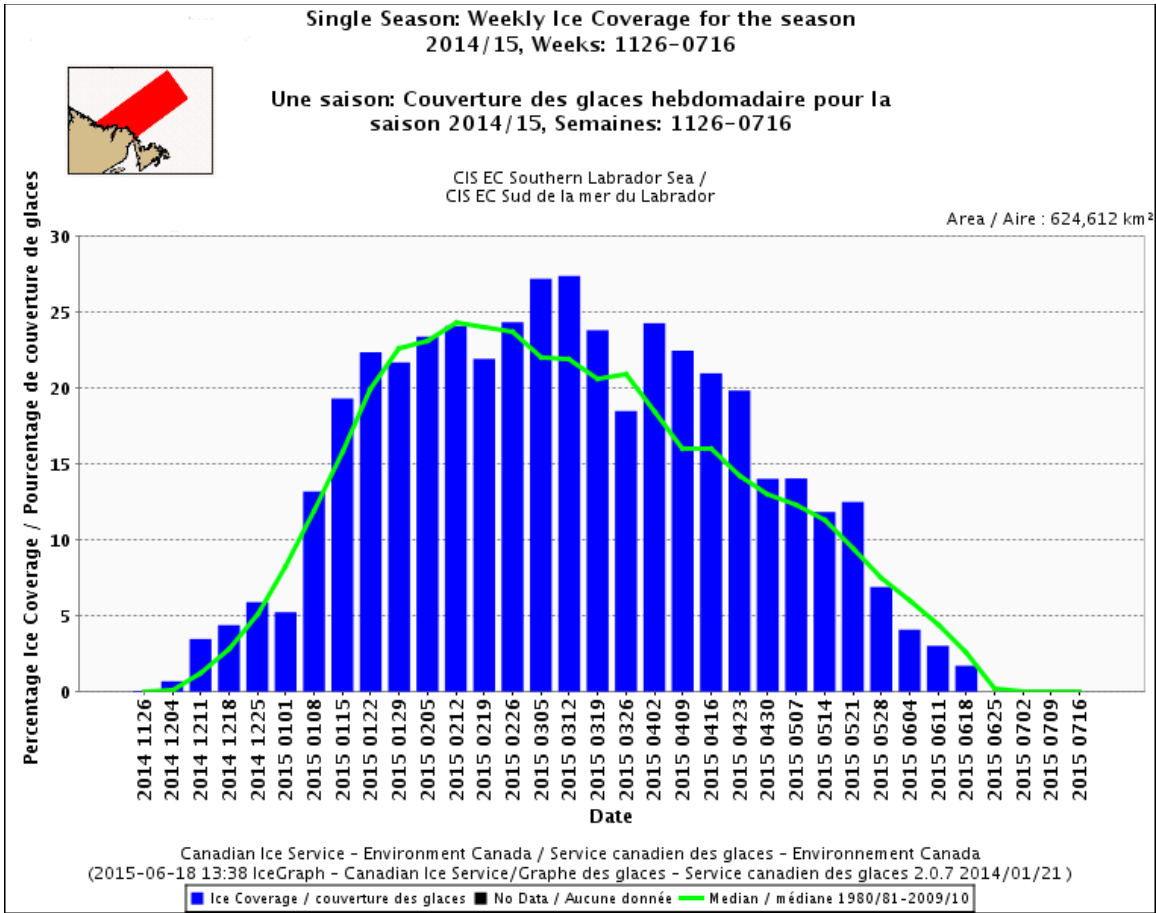


Figure 13: Weekly Ice Coverage for the 2014-2015 season for the Southern Labrador Sea.

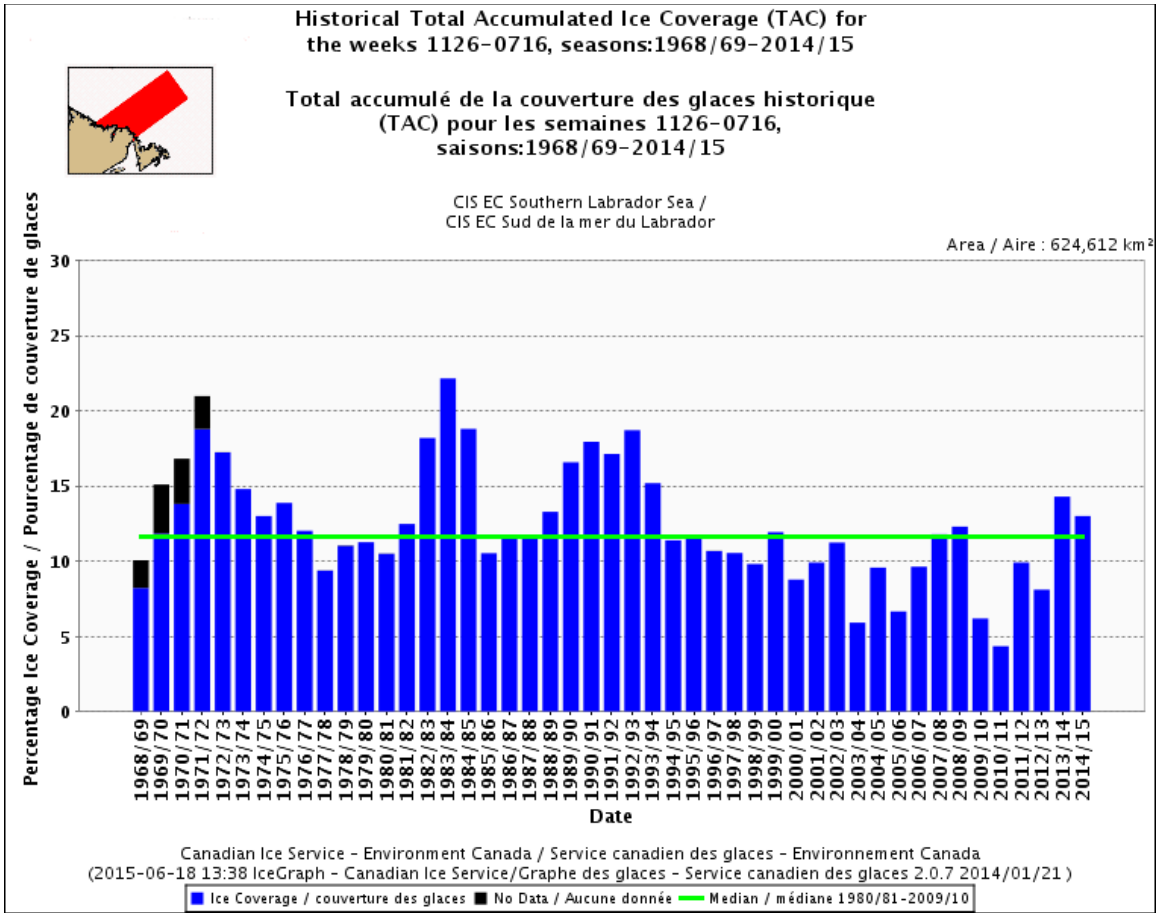


Figure 14: Historical Total Accumulated Ice Coverage for the Southern Labrador Sea by season, 1968-2015.

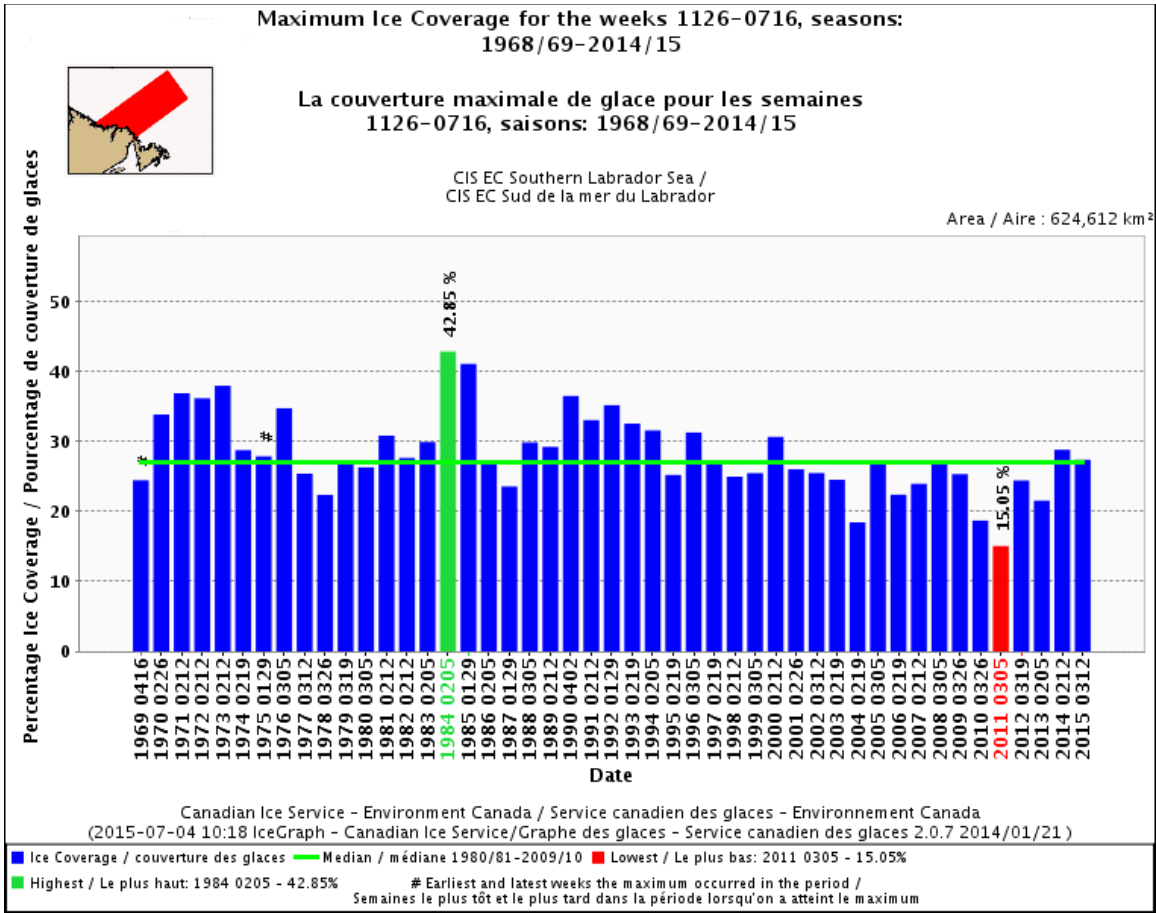


Figure 15: Maximum Ice Coverage in the Southern Labrador Sea by season, 1968-2015.

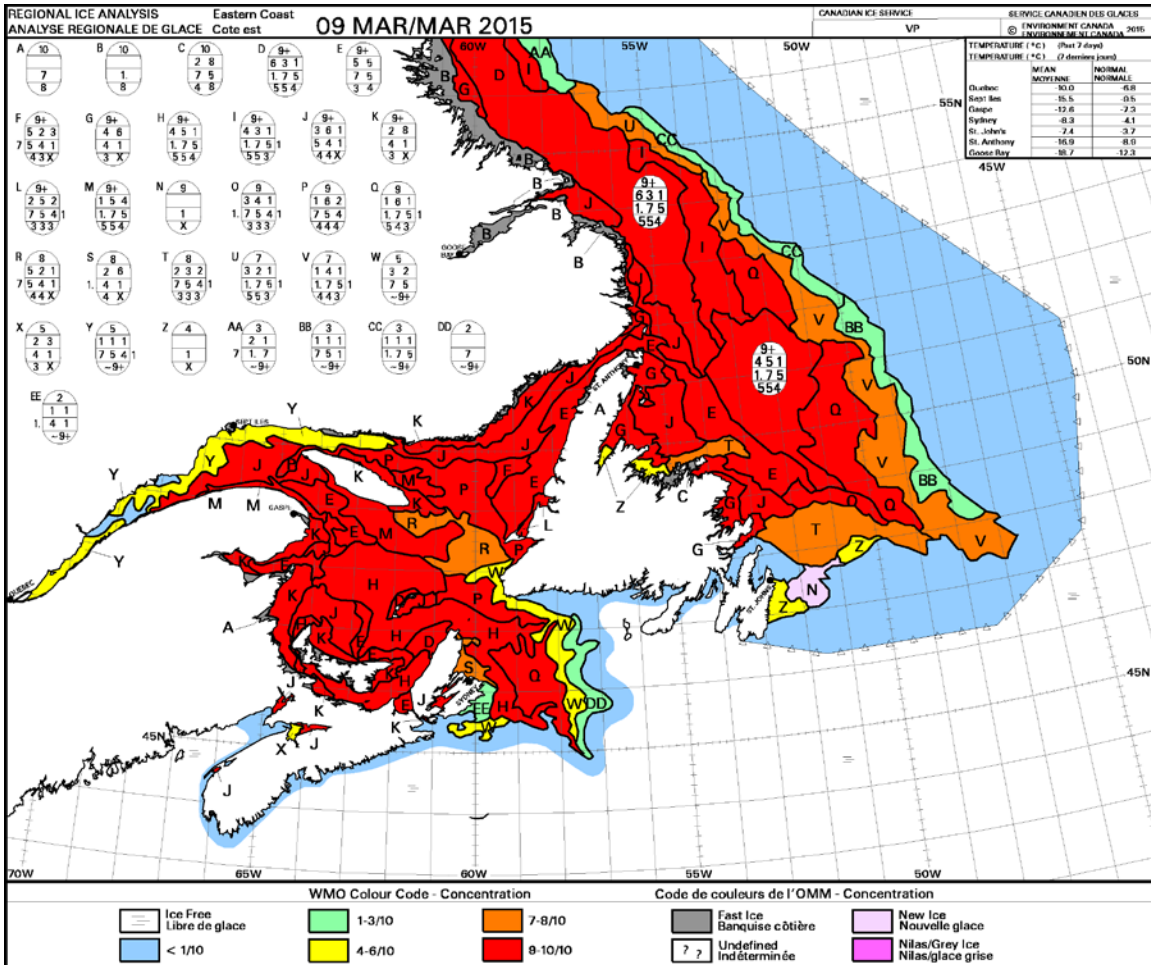


Figure 16: Maximum ice coverage on the East Coast during the 2014-15 season.