



# Seasonal Summary

Eastern Canada

Winter 2019-2020

By



Canadian Ice Service  
Le service canadien des glaces



## Summary for the East Coast

The 2019-2020 East Coast ice season saw below normal ice cover. The season can be defined by a late start, slightly below peak ice cover, and an early melt. The ice season followed the usual general build up of ice coverage starting in January with a peak in late February to early March, and a melt of ice tailing off in late June/early July. Although it followed the pattern, ice cover was lower than the median amount during all weeks of the ice season.

Much like the previous (2018-2019) ice season an unseasonably cold air mass spread over the East Coast in mid-November starting ice formation along a few coastal areas. Despite this early season ice formation, much of it melted by December as more seasonal temperatures established themselves over the East Coast. December saw some small ice growth, especially in coastal Labrador and in Lake Melville, but no significant ice formed in the Gulf of St. Lawrence until the last few days of the month. One of the main drivers in the December and early January period was a significant warm air mass over Davis Strait and Labrador, slowing ice growth in those waters where we would usually see significant expansion at that time of year. Overall, surface air temperatures for much of the winter were near to above normal.

By January, ice cover growth was around three weeks behind normal and would remain so until the peak of ice in the third week of February. Ice growth was steady during this timeframe. Ice coverage peaked at 18.6%, lower than the long-term median of 24.1%. This was the lowest peak ice cover for the East Coast region since 2012-2013 (14.4%). Temperatures from early December through March were generally slightly above normal.

Much like most years on the East Coast, ice coverage remained fairly steady (between 16.1-18.6%) through until mid-March. There is usually a steady downward trend in ice cover starting in mid-March. The drop was more rapid this year as, due to generally warmer temperatures than normal over the winter, ice was thinner than normal. Because of the thinner ice, ice cover dropped rapidly and then remained 2-3 weeks ahead of the median for ice melt through into May.

At the end of March significant retraction of the ice near the Grand Banks occurred. The first week of April saw most the mobile ice in the southern Gulf of St. Lawrence melt out, with all remaining ice disappearing out of the southern areas of the Gulf by the third week of the month. Meanwhile, ice remained in the Strait of Belle Isle and offshore of the Northern Peninsula in Newfoundland. Significant ice destruction occurred at the end of April with all ice melting out of the southern Newfoundland waters by the end of the month, roughly a month earlier than usual.

Ice in southern Labrador started out May offshore but within the first two weeks of the month was isolated to only the coastal area north of Groswater Bay and Lake Melville. Ice cover on the East coast fell to 1% or lower by mid-May. The ice in Lake Melville fractured in the third week of the month, fully melting in early June. For the rest of June ice cover remained steady as ice continued to drift from northern Labrador to southern Labrador before melting out completely in the first few days of July.

The season TAC (Total Accumulated Ice Coverage) for the 2019-2020 season was 5.7%. This is the 9<sup>th</sup> lowest TAC since the 1968-1968 season and the lowest TAC since the 2012-2013 season.

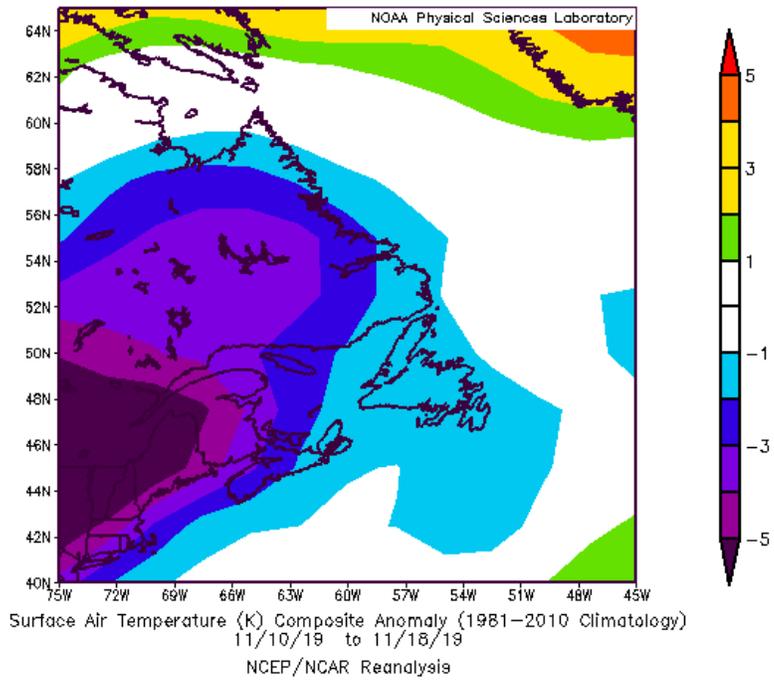


Figure 1: Surface Air Temperature Anomaly - November 10, 2019 to November 18, 2019.

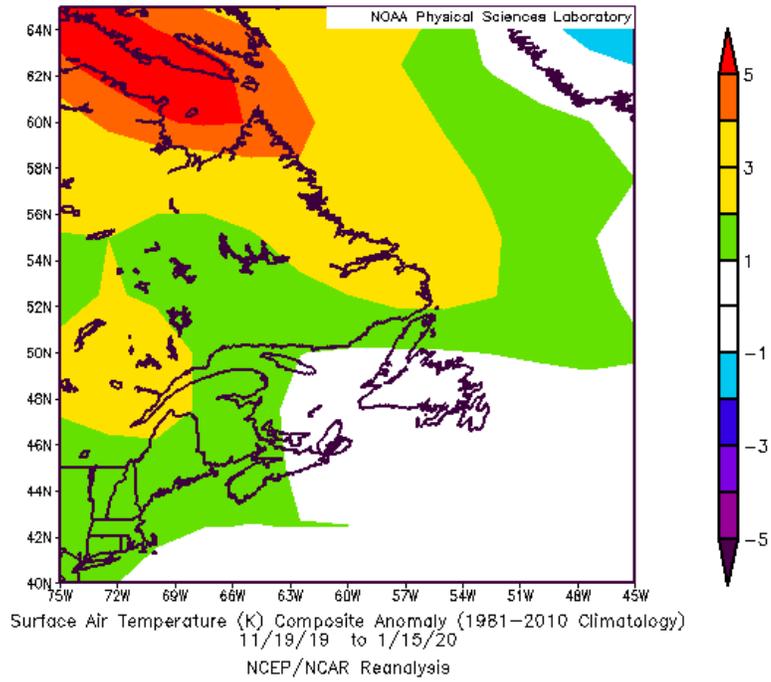


Figure 2: Surface Air Temperature Anomaly - November 19, 2019 to January 15, 2020.

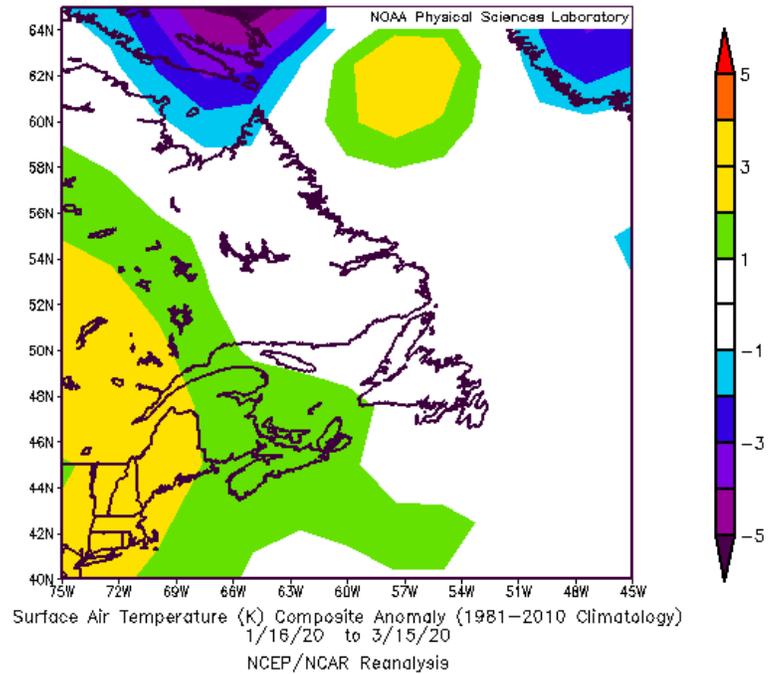


Figure 3: Surface Air Temperature Anomaly - January 16, 2020 to March 15, 2020.

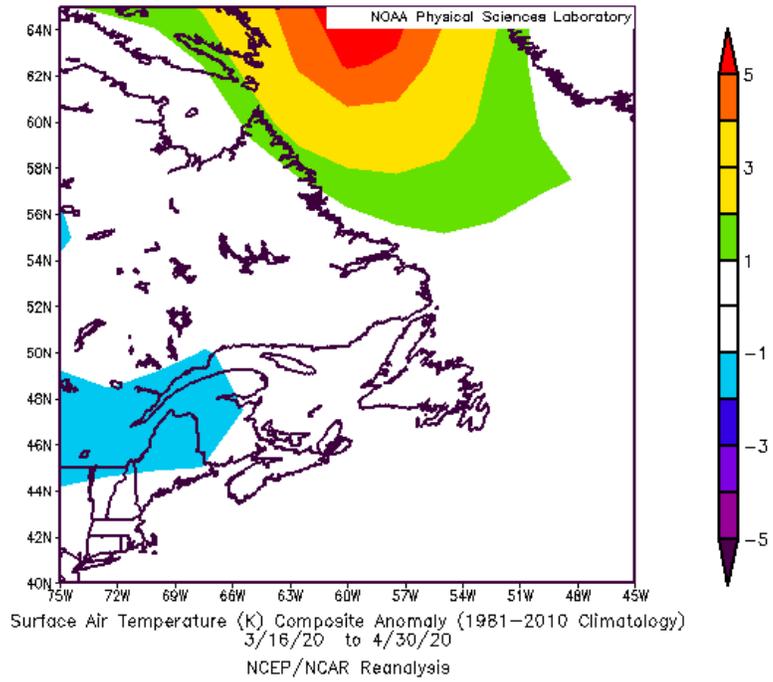


Figure 4: Surface Air Temperature Anomaly - March 16, 2020 to April 30, 2020.

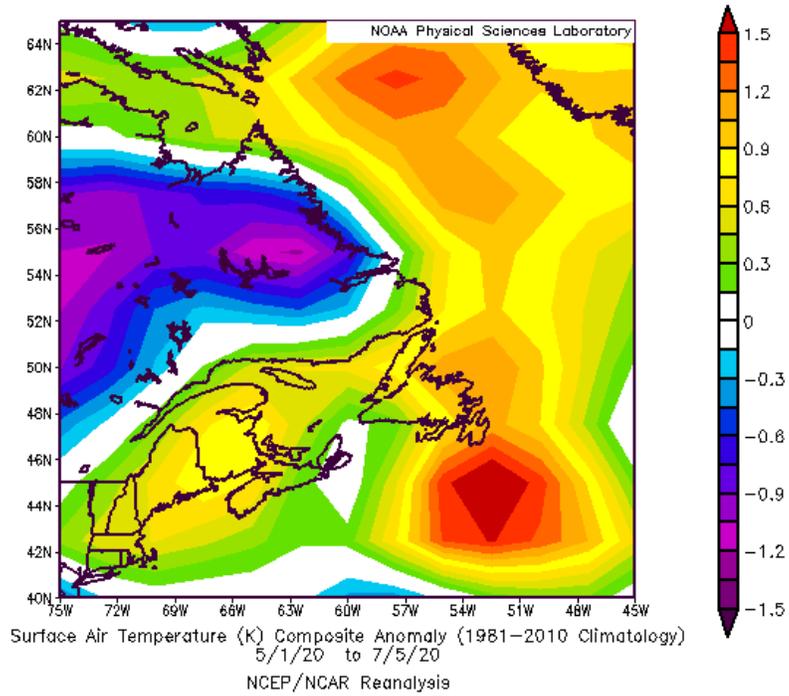


Figure 5: Surface Air Temperature Anomaly - May 1, 2020 to July 5, 2020.

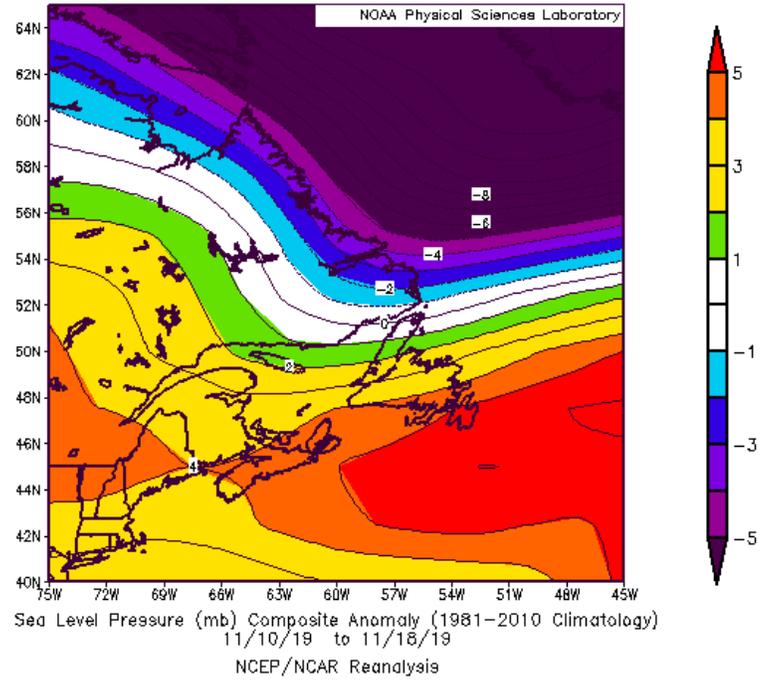


Figure 6: Sea Level Pressure Anomaly - November 10, 2019 to November 18, 2019.

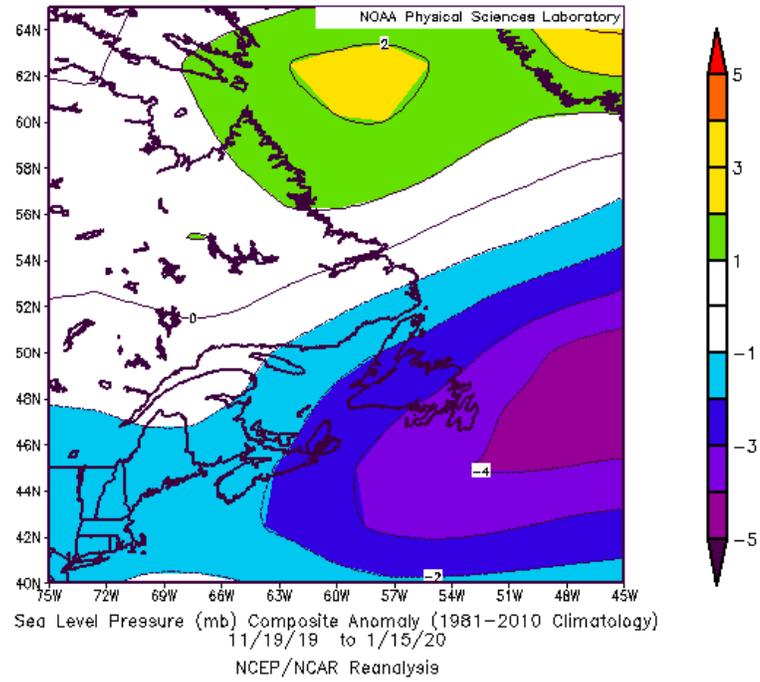


Figure 7: Sea Level Pressure Anomaly - November 19, 2019 to January 15, 2020.

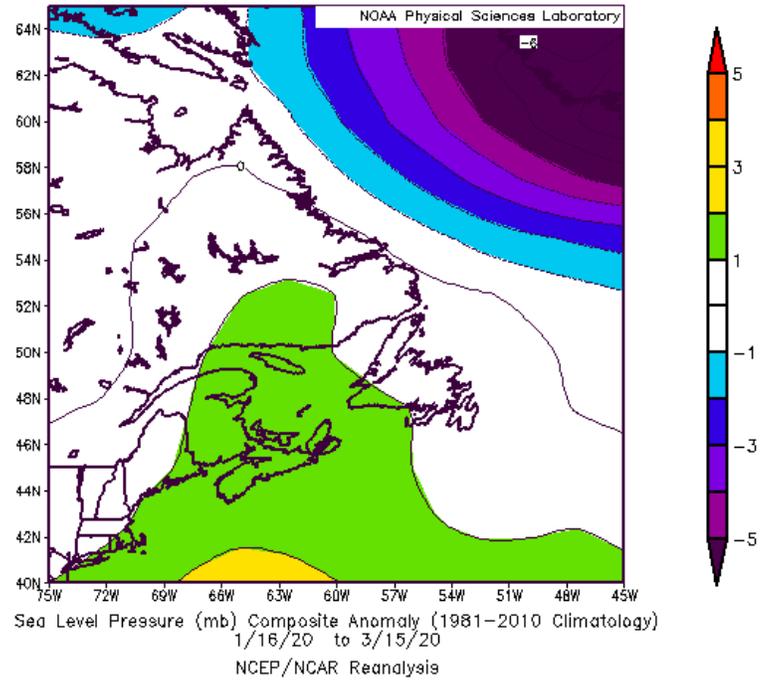


Figure 8: Sea Level Pressure Anomaly - January 16, 2020 to March 15, 2020.

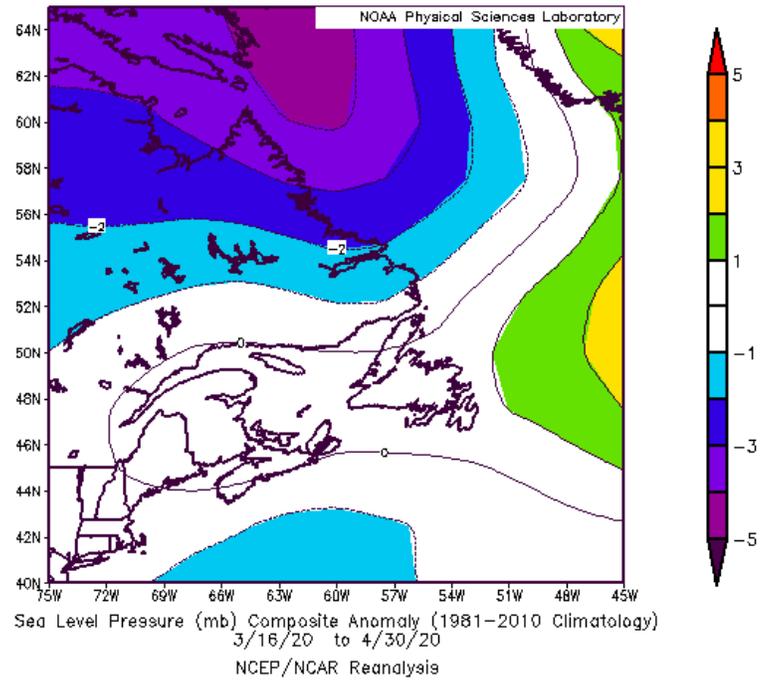


Figure 9: Sea Level Pressure Anomaly - March 16, 2020 to April 30, 2020.

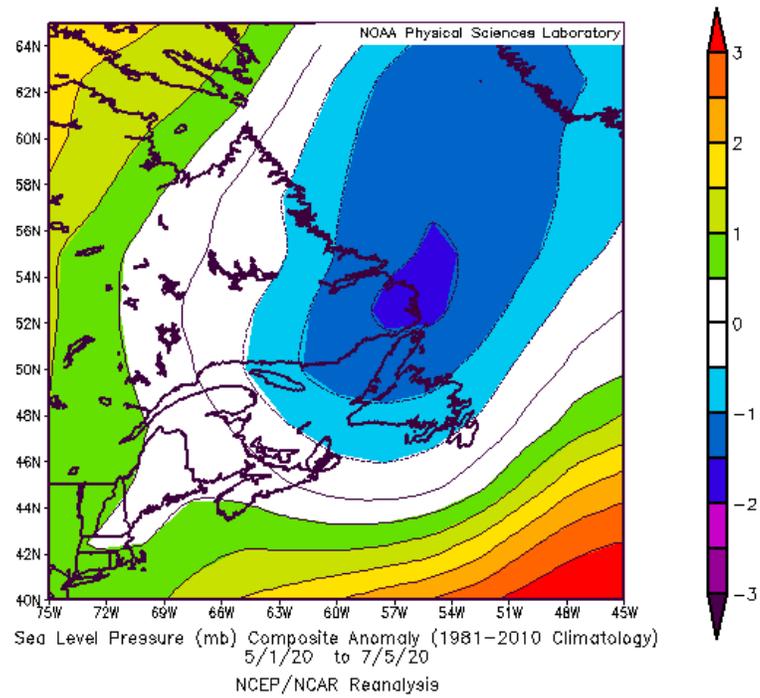


Figure 10: Sea Level Pressure Anomaly - May 1, 2020 to July 5, 2020.

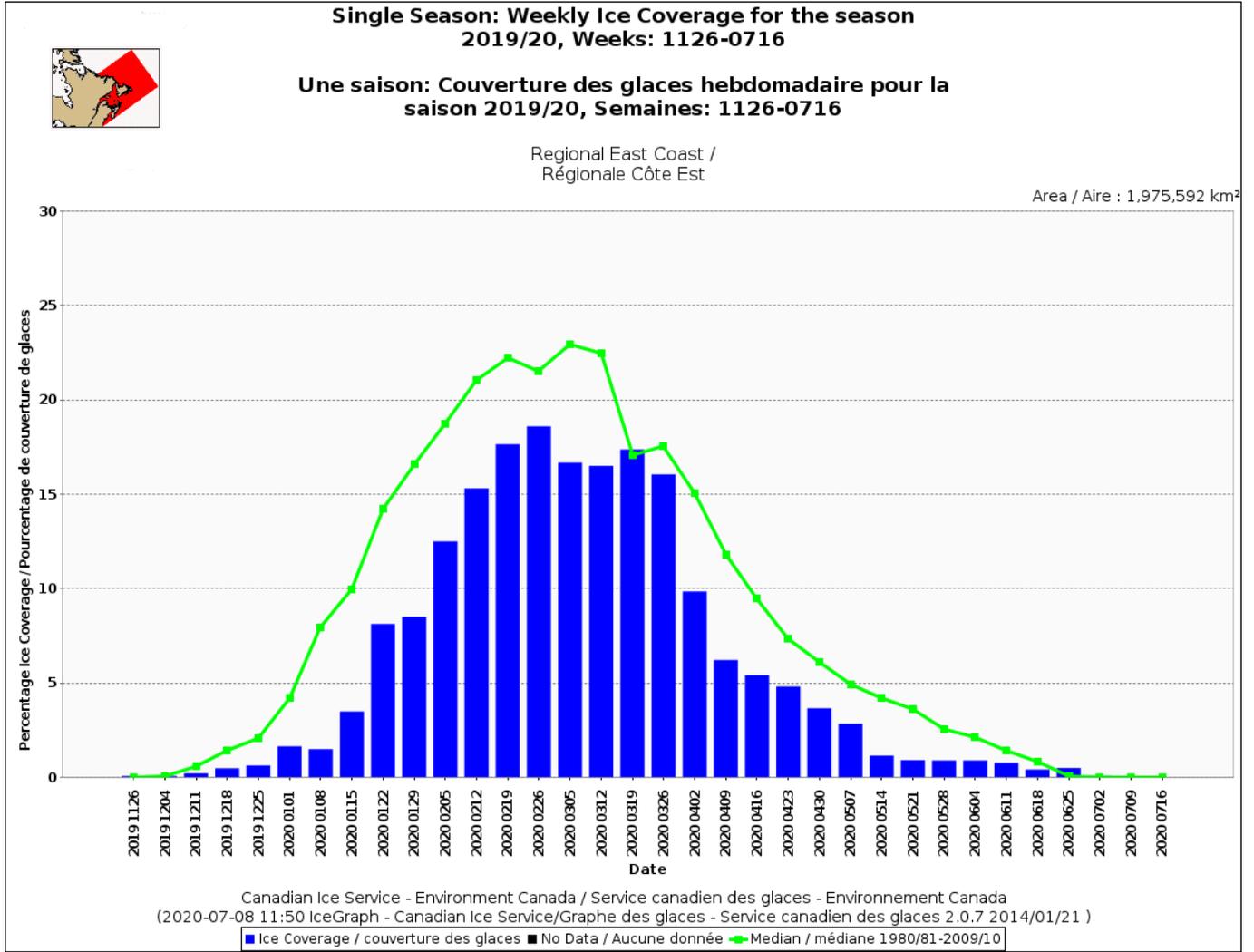


Figure 11: Weekly Ice Coverage for the 2019-2020 Season for the East Coast.

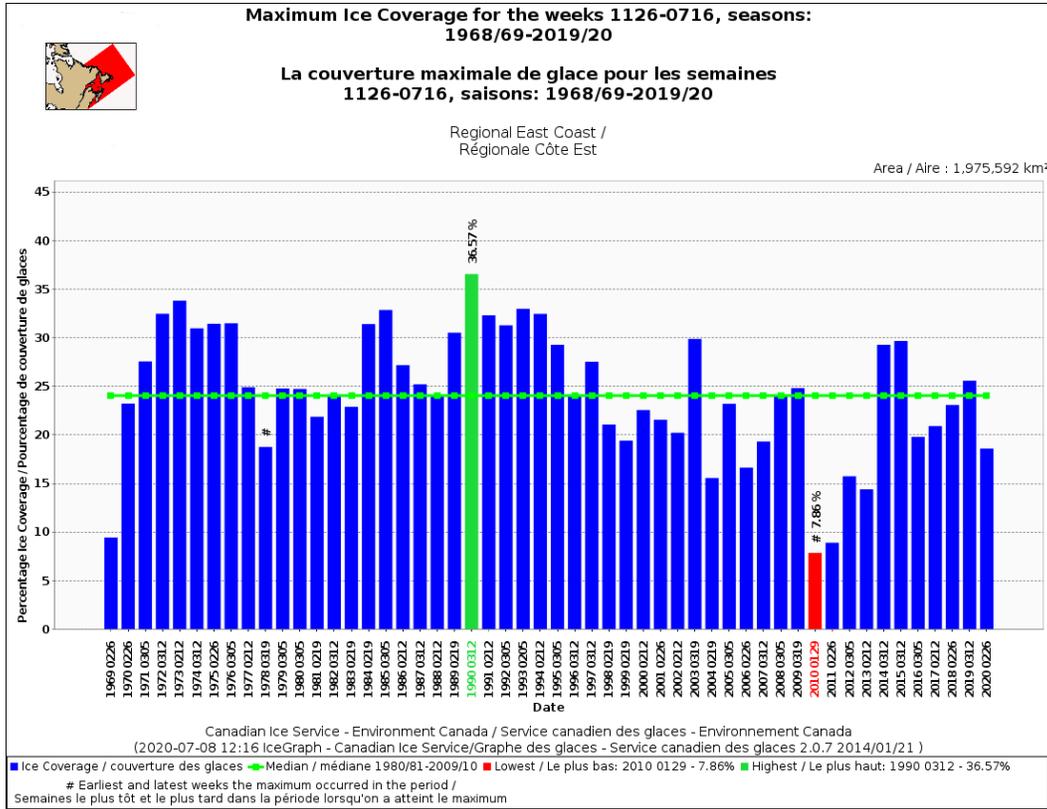


Figure 12: Maximum Ice Coverage for the East coast by Season, 1968-2020

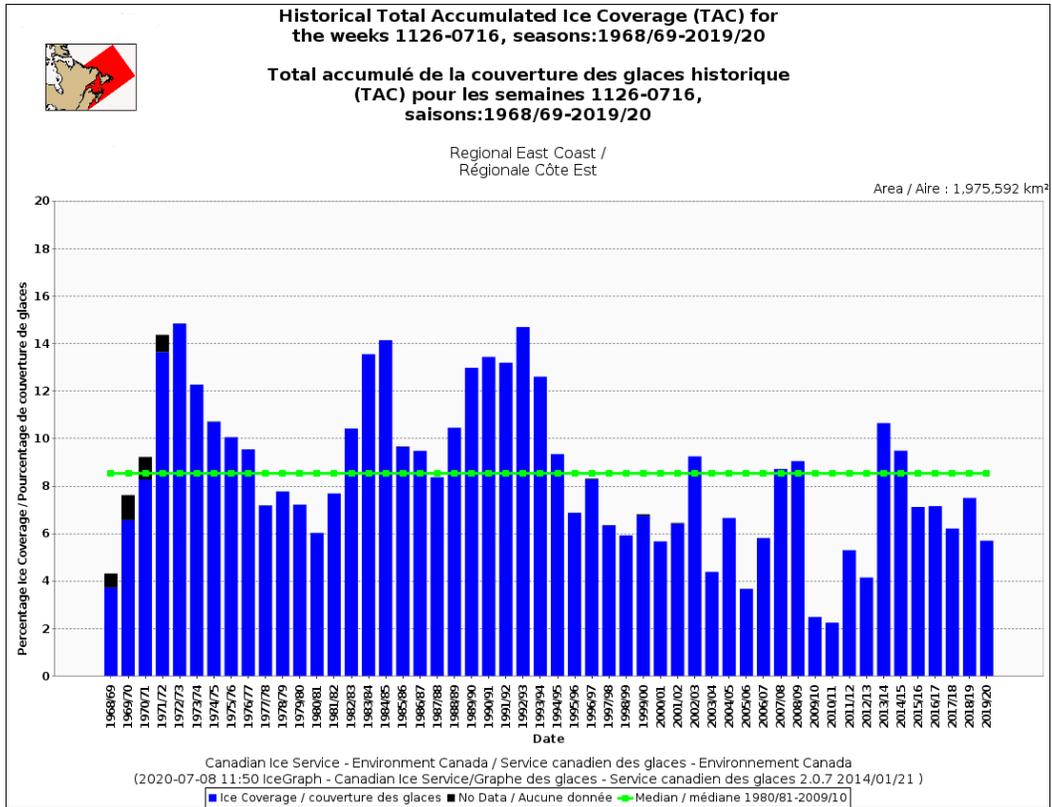


Figure 13: Historical Total Accumulated Ice Coverage for the East Coast of Canada by Season, 1968-2020

## **Gulf of St Lawrence**

### **2019-2020 Season temperature: November to June**

When examined for the entire November-May season, average air temperatures were near normal across the Gulf region.

Surface air temperatures of three to five degrees below normal in the Gulf, coldest in the western section, started the ice season off in the Gulf of St. Lawrence in early November. The cause of this outbreak was a significant above normal pressure area over the Gulf and significantly low pressure area in the Labrador Sea and over Greenland.

Starting in late November, average surface air temperatures moderated in the eastern half of the Gulf. Above normal temperatures continued, on average, from the end of November until the middle of March in the western part of the Gulf. Average temperatures were one degree Celsius above normal for the lower North Shore of Quebec through to Anticosti and south to PEI. Temperatures were closer to three degrees above normal in the western part of the estuary to the St. Lawrence River. Although there were brief periods of warmer/colder temperatures during this time, significantly abnormal periods of more than a week did not occur, leading to a steady temperature trend. Sea level pressure during November to January timeframe was near normal in the estuary of the St. Lawrence River while anomalously low pressure was present over the Grand Banks of Newfoundland and above average pressure were present in Davis Strait. A shift occurred in mid-January with slightly above normal pressure over the Gulf.

The end of the season saw below normal temperatures starting in mid-March for the estuary of the St. Lawrence (1-2 degrees Celsius below normal) and near normal average temperatures through most of the Gulf region. Average sea level pressure was near normal from mid-March to the end of April.

### **November Ice Conditions**

Some small areas of ice formed in early November just west of Sept Iles. Well below normal temperatures in mid-November allowed the formation of low concentrations of new ice along many coastal areas of the Quebec lower North Shore, western Anticosti Island, in the estuary to the St. Lawrence River, and along parts of New Brunswick and Prince Edward Island coasts. The ice formed did not become mobile and move away from the coast. A return to more seasonal temperatures saw most of the coastal ice melt out by the end of the month.

### **December Ice Conditions**

The first mobile ice, outside of the coastal areas, formed in the St. Lawrence estuary, near Quebec City, at the end of the second week of December. Ice cover remained below 1% across the Gulf until the end of the third week when it increased to 1.3% ice covered, close to the normal 1.6% covered. New ice formed mainly in the estuary of the St. Lawrence, along the lower North Shore of Quebec, and some new ice in the western Northumberland Strait along the New Brunswick coast. The last week of the month had below normal ice growth for the end of the calendar year. Ice cover rose to 2.7% by the end of the month compared to the 4.7% normal at that time of year. The increase in ice occurred along the northern shore of the Gaspé Peninsula and along the entire shore of New Brunswick. Ice was mainly composed of new ice in concentrations of 2-8 tenths, with small concentrations of grey ice present, especially in the estuary to the St. Lawrence.

## January Ice Conditions

January ice conditions came in like a lamb with almost no change ice coverage or thickness in the first week. January usually sees median ice cover increasing by 5-10% a week. Ice cover increased to 3.0% by the end of the first week. In the second week the first significant increase in ice occurred for the year with cover increasing to 7.4%, still less than half of the 15.0% normal ice coverage for mid-January and around 10 days behind normal ice growth. The estuary almost completely filled with new ice. Some grey-white ice was present in the extreme western extents of the estuary. Ice concentrations thickened along the New Brunswick coast while the western half of the Northumberland Strait filled with new ice. Ice remained in similar thickness and concentration along the Quebec lower North Shore with cover along the coast of 6-8 tenths of new and grey ice.

The third week saw a substantial increase in ice coverage to 16.8%. The estuary became fully covered with ice, mainly new and grey, however some grey-white ice developed in the western section and along the Gaspé Peninsula. 9 tenths of new and grey ice were present the entire length of the lower North Shore of Quebec all the way to the Strait of Belle Isle. The Northeast Arm, north of Port au Choix, became covered in 9 tenths of new and grey ice. Ice thickened to include some grey-white ice in southern Chaleur Bay and the western portion of the Northumberland Strait. Ice extent increased eastwards from New Brunswick by 1 to 1.5 degrees away from the coast. A few patches of ice formed near the Magdalen Islands and along parts of the west coast of Newfoundland. The final week of the month saw ice cover remain steady as a complex low pressure area moved across the region. Ice cover dropped to 15.4%. During the week, around 50% of the ice in the estuary was destroyed while there was an expansion of the ice south of Anticosti Island. Ice pulled away from the coast of New Brunswick, pushing another degree eastwards to cover much of the water between New Brunswick and the Magdalen Islands. Ice became predominantly grey-white in the western Northumberland Strait and in some of the remaining ice in the estuary.

## February Ice Conditions

Ice conditions continued to increase in early February during some of the coldest time of the year in the Gulf of St. Lawrence. Ice cover increased to 26.7%, lower than the 31.8% climate median for the first week of February. The entire western portion of the Gulf became ice covered from the Magdalen Islands westwards. The first ice of the year developed west of Cape Breton. The estuary re-filled in with ice. Ice in the northeastern section of the Gulf increased in ice cover and thickness as it began to flow in from the northeast through the Strait of Belle Isle.

Historically, the mean ice coverage remains near 40% from mid-February to mid-March. This year during the second week of February there was an uptake in ice coverage to 34.9%. Ice thickened substantially across much of the Gulf during this week. Thin first-year ice developed in the pack ice in the centre of the Gulf and in the Northumberland Strait. Ice began to flow around Cape North on Cape Breton Island. Coverage increased slightly, now covering from the New Brunswick to areas slightly north and east of the Magdalen Islands, as well as extending further from the lower North Shore of Quebec in the northeast arm of the Gulf.

Significant ice thickening continued through mid-February with the main ice pack in the centre of the Gulf becoming grey-white with some first-year ice embedded. Ice was pushed southeastwards by a large ridge of high pressure centred south of the Maritimes. This ridge caused grey and grey-white ice

to flow through the western portion of the Cabot Strait. Although ice cover only increased by 1.3%, to 36.2% covered, there was significant expansion of ice to the east and southeast. Ice in the Northeast Arm pushed closer to the Newfoundland coast and stretched south from the Quebec shore past Anticosti Island. An open water lead developed along the north shore of the estuary from the Saguenay to east of Sept-Iles. The third week of February marked the maximum ice cover for the season. 36.2% ice coverage in the 2019/20 season is lower than the long-term median of 45.6%, however was very close to the 10-year median of ice cover of 36.8%. This maximum was the ninth lowest maximum since the 1972/73 season.

The following week saw conditions continue expansion southeastwards with larger leads forming along the lower North Shore and the coast of New Brunswick due to a broad low pressure system crossing through Ontario and Quebec. Ice flowed around the coast of Cape Breton and covered the entire length of the Cabot Strait. The opening of the leads and movement of ice southeast maintained ice cover at 36.0%, 3.3% lower than the climate median. The last week of the month saw a retraction of ice cover as ice pushed northwestwards. Ice in Cabot Strait remained only in the western section. The main pack of ice in the centre of the Gulf shifted back westwards. The majority of the ice was now grey-white and thin first-year thickness. Ice in the Northumberland Strait was predominantly thin first-year ice. Some new and grey ice re-developed in the estuary, filling in the coastal lead that had been present for the two previous weeks. Ice cover fell slightly to 32.3% at the end of the month, below the median of 41.8%. Historically this is the time of year with the highest ice coverage for the Gulf region.

### **March Ice Conditions**

The first two weeks of March had ice beginning to surround Cape Breton Island as it had in mid to late February. Through the centre and northern half of the Gulf, new ice developed over much of the open water areas and open leads that were present at the end of February. The portion of the estuary near the Saguenay and slightly east remained mainly open water. Ice thickness in the centre of the Gulf was a combination of grey-white and thin first-year ice. Generally, ice concentration decreased from 9 to 9+ tenths to areas of 7-9 tenths through the centre of the Gulf. A band of predominantly thin first-year ice remained northeast of PEI and in the Northeast Arm. At the end of the second week ice cover climbed back to 34.1% ice covered. Historically after the second week of March, ice loss in the Gulf is generally 7-8% a week until the second week of April.

Significant loss of sea ice, as is usually during the third week of March, occurred this year. Ice cover dropped to 30.0%, close to the climate median of 32.2%. Again, significant decreasing of the concentrations occurred, mainly in the centre of the Gulf. Much of the new and grey-white ice in the centre and southern portion of the Gulf melted out. Ice export out the southern Cabot Strait continued in concentrations of 2 to 5 tenths. Cool temperatures did allow the creation and maintenance of new ice in the northern half of the Gulf. Significant mobile ice loss occurred northwest of PEI and along the New Brunswick eastern coast. At the end of the third week, ice cover fell to 27.0%.

The last week of the month saw the largest change in ice conditions of the year, with ice cover falling to 4.5% by the end of the month, a drop of 22.5% in one week. This coincided with a series of low pressure systems that moved southeast of Newfoundland along with average temperatures generally pushed above the freezing mark. The remaining ice was present in a band north of PEI stretching eastwards to Cape Breton Island, some smaller areas of ice in the Northumberland Strait and in southern Chaleur Bay, and near Sydney. A significant amount of ice remained in the Northeast Arm of the Gulf, with areas of 2 to 9 tenths of grey-white and thin first-year ice in that area.

## **April Ice Conditions**

After the large drop in ice conditions in late March, ice melt continued in the first week of April. All mobile ice melted out from the southern half of the Gulf with the exception of small areas of coastal ice in southern Chaleur Bay and on the southern coast of the Northumberland Strait. Unusually, a small area of ice remained in the immediate vicinity of Sydney Harbour, causing issues with ferry traffic into and out of the port. Some coastal fast ice remained along parts of the New Brunswick and Prince Edward Island coasts. Ice remained in 9 tenths of concentration along the Quebec shoreline in the northeastern section of the Gulf. Ice cover fell to 2.5% covered, well below the climate median of 9.8%.

Rotten fast ice remained the only ice in the southern half of the Gulf through mid-April. The northeastern section continue to slowly decrease in concentration, however ice continued to flow through the Strait of Belle Isle leading to little reduction in the amount in the section. Ice was mainly in areas of 5-9 tenths of thin and medium first-year ice. Ice cover dropped to 2.1% by mid-month. The third week saw a reduction of ice in the northeastern part of the Gulf as ice was destroyed and melted. The ice was mainly isolated to a thin band of 9 tenths of first-year ice along the north coast of the Northeast Arm into the Strait of Belle Isle. Ice cover dropped to less than 1% in the third week; roughly 2-3 weeks ahead of the normal ice melt. Leading into the end of the month, all remaining rotten fast ice in the southern Gulf melted, and ice cover in the northeastern section reduced further to less than 0.5% covered. A thin band of 9 tenths of first-year ice remained along the northern coast of the northeast arm.

## **May Ice Conditions**

Continued ice melt started the month of May while the only ice remaining in the Gulf region was along the lower North Shore of Quebec in small concentrations. This ice underwent continued melt, with all mobile ice melting in the first week of the month. The remaining small amount of rotten fast ice melted in the second week of the month, leaving no remaining ice in the Gulf of St. Lawrence region.

The TAC for the 2019-2020 Gulf of St. Lawrence ice season ended at 9.26%, lower than the 12.7% long term median of TAC. This was lower than the previous season.

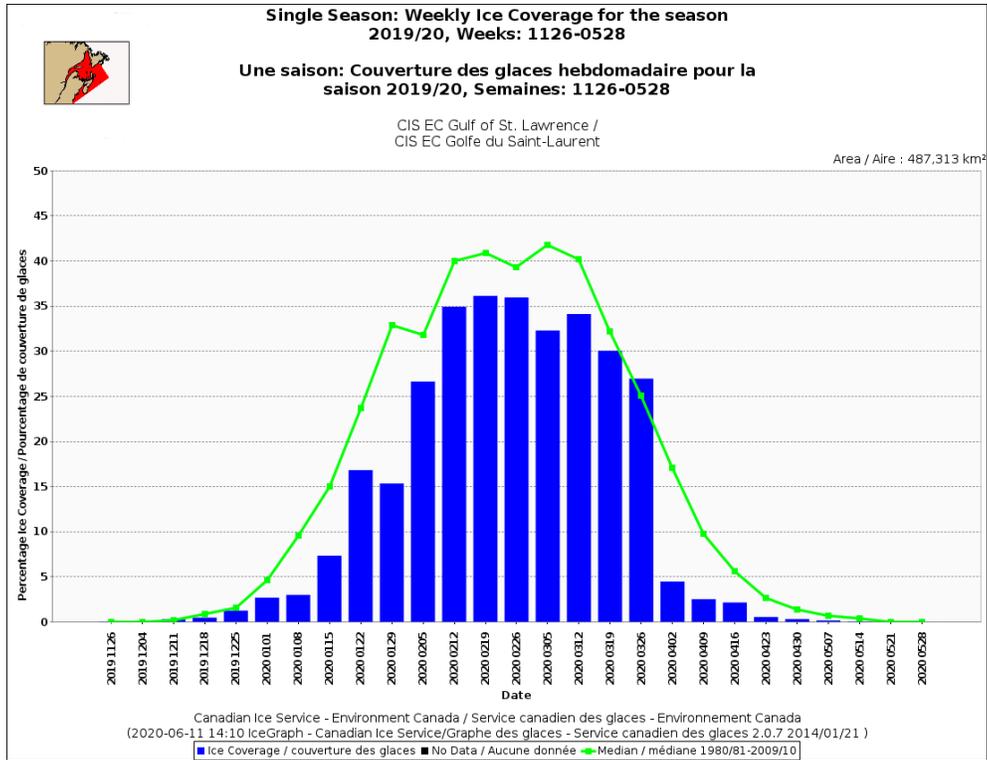


Figure 14: Weekly Ice Coverage for the 2019-2020 Season in the Gulf of St. Lawrence

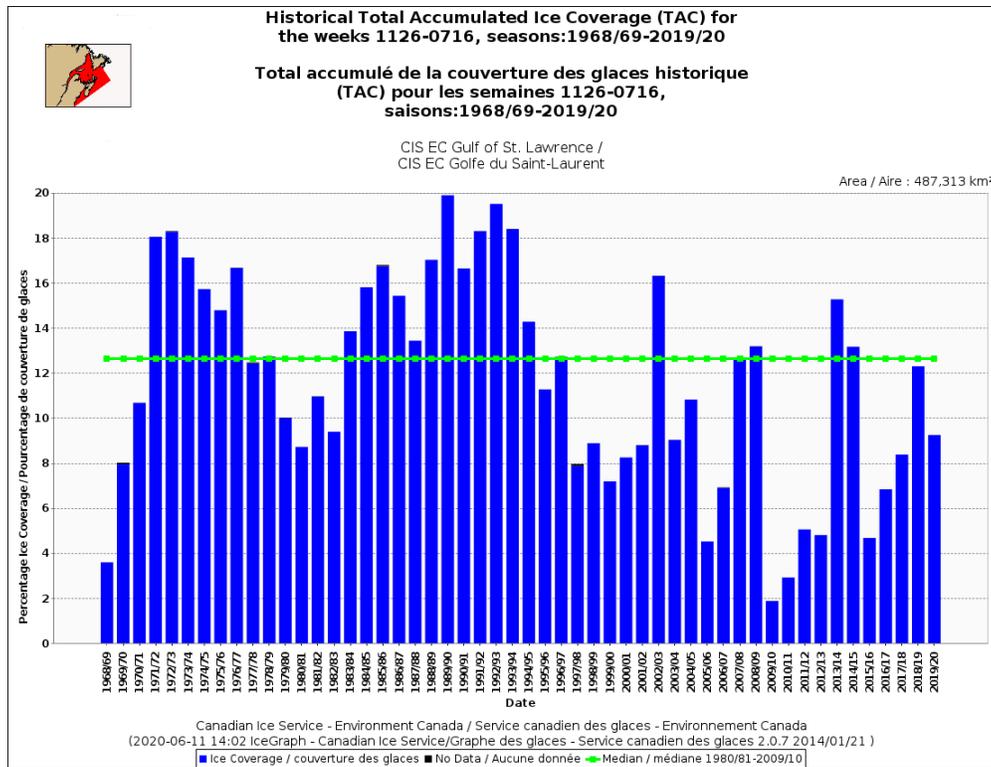


Figure 15: Historical Total Accumulated Ice Coverage for the Gulf of St. Lawrence by Season, 1968-2020

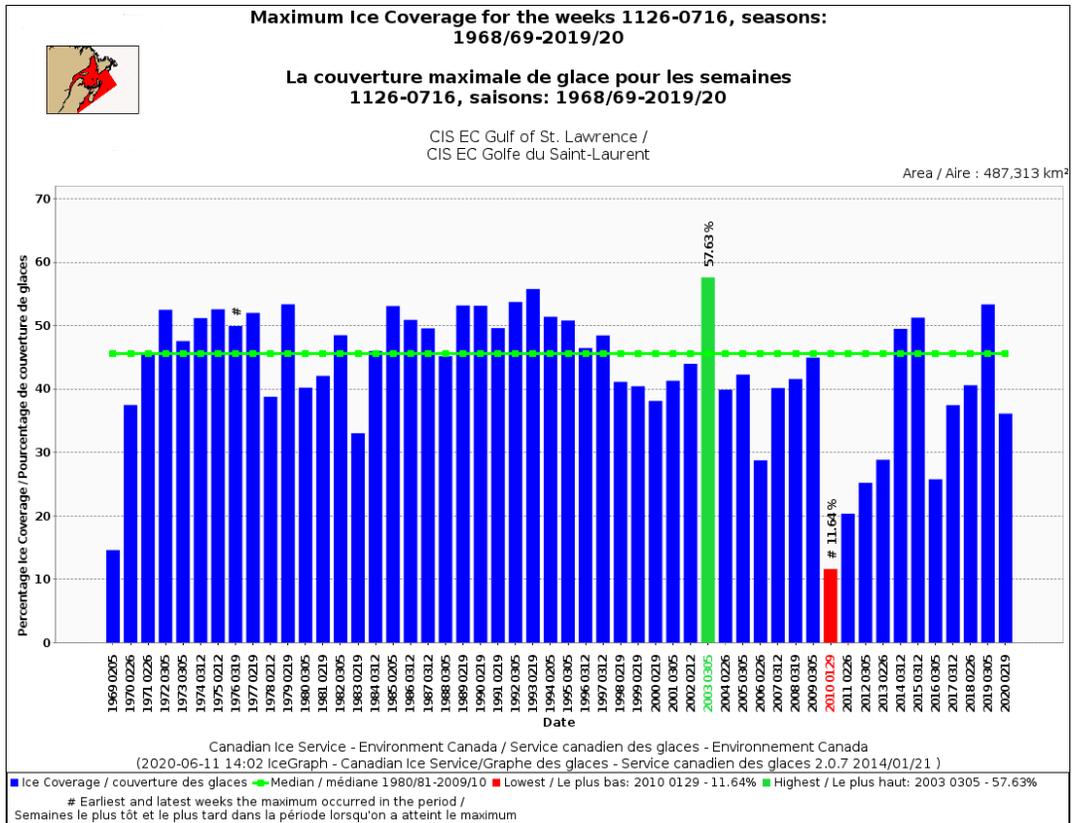


Figure 16: Maximum Ice Coverage in the Gulf of St. Lawrence by Season, 1968-2020

## **Newfoundland and Labrador Waters**

### **2019-2020 Season temperature: November to June**

Average air temperatures in the middle of November were 2-3 degrees Celsius below normal, leading to the first ice formation of the year along the Labrador coast. During the time a significantly below normal air pressure regime was in place over Greenland, affecting coastal Labrador. Above normal pressure patterns were present along southern Newfoundland and Greenland.

As has occurred in many of the previous winters, well above normal average temperatures occurred in Davis Strait and northern Labrador through much of the winter. From late November to mid-January average temperatures were 4-5 degrees Celsius above normal in northern Labrador and closer to three degrees above normal in southern Labrador. The Northern Peninsula of Newfoundland had temperatures closer to 1-2 degrees Celsius above normal. Generally, during this time, there was anomalously low pressure over the Grand Banks.

For Newfoundland near normal temperatures dominated the remainder of the season until May.

Labrador saw near normal temperatures from January to mid-March, with some slightly above normal temperatures in the northern stretches of the Labrador Sea. The above normal temperatures seen during many of the last winters returned from mid-March until the end of April. Northern Labrador had temperatures 1-2 degrees Celsius above normal, while offshore in the northern Labrador Sea and Davis Strait, temperatures were closer to 3-5 degrees Celsius above normal. Southern Labrador saw closer to seasonal temperatures. In general, low pressure occurred over Greenland and northern Davis Strait.

May and June saw a continuation of near normal temperatures along coastal Labrador area with some warmer (one degree above normal) temperatures in the offshore area of the Labrador current. Significant anomalous low pressure occurred, centered over southern Labrador, leading to generally onshore flow and compaction of ice along the coast.

### **November Ice Conditions**

The first ice of the season formed in mid-November as small concentrations of ice formed on Lake Melville, in similar timing to most years. Concentrations in southern Labrador stayed consistent through the end of the month as higher than normal temperatures set up over the region in late November and early December.

No ice formed in Newfoundland waters in November 2019.

### **December Ice Conditions**

Along the South Labrador coast warmer than normal temperatures kept ice growth to a minimum in the first few days of the month. By the 9<sup>th</sup> of December, Goose Bay filled in with 9 tenths concentration of new ice, slightly increasing ice coverage in southern Labrador. A brief period of cold temperatures in mid-December saw the formation of low concentrations of new ice the length of the Labrador coast. Some ice became fast in the extreme western and eastern sections of Goose Bay. Ice cover in

Southern Labrador increased to 1.1% ice covered, well beneath the 5.2% normal for that time of the year and roughly 3 weeks behind normal ice growth. No significant ice cover increase occurred in the third week of the month, however the predominant ice type in Goose Bay thickened to grey-white ice. By the end of the month, Goose Bay became fast with grey and grey-white ice while some new ice in concentrations of 7-9 tenths formed along coastal Labrador. Ice cover increased slightly to 3.1%, well below the normal for the end of December of 8.2%. Ice growth remained 2-3 weeks behind normal.

No significant ice formed in Newfoundland in December 2019.

### **January Ice Conditions**

Ice in Goose Bay thickened to thin first-year ice in the first week of the month. Coastal Labrador saw the compression of ice due to onshore winds causing the compaction of grey ice along the coast. Ice cover fell to 2.4% after the first week then climbed to 5.2% by mid-month as near normal temperatures allowed significant ice formation to occur along the coast, mainly filling with grey ice. By mid-month ice cover was less than 1/3 of the usual cover of 15.8%. Ice growth, due to warmer temperatures in late December and early January, was 2-3 weeks behind normal.

The last two weeks of January saw a significant increase of ice cover in Labrador. The third week saw below normal temperatures and ice cover bloomed to 12.1% ice covered. This new ice development was mainly in the pack off Labrador with ice present as a mixture of young ice (new, grey, grey-white). Ice stretched the entire length of the Labrador coast down through the Strait of Belle Isle. Ice in the Strait was mainly new in the third week of the month. The last week of the month ice cover continued to increase to 14.4%, below the median of 22.6%, and roughly 2-3 weeks behind the normal ice growth. During the final week of the month, a large amount of the coastal mobile ice thickened to grey-white ice, with higher concentrations of ice along the coast and lighter concentrations (4-6 tenths) at the marginal ice zone.

Newfoundland waters saw only development of a few patches of local fast ice in isolated bays in northeastern Newfoundland and along the Northern Peninsula. Ice cover remained below 0.5% covered by the end of the month, well behind the climate median of 4.1%. Ice growth was three weeks to one month behind the normal in January. The main cause of this was the abnormally warm temperatures in December and early January.

### **February Ice Conditions**

Slow ice growth continued in February along the Labrador coast. The first thin first-year ice developed in the pack ice in the first week of the month as a trace amount, increasing to 4 tenths by mid-month. Ice cover rose gradually to 16% then 17% ice covered by mid-month, around 7% lower than the climate median. In the third week of the month ice cover increased to 20.6%. By the 24<sup>th</sup> of the month, ice cover reached their peak extent of the year at 22.1%. During the week the fast ice north of Groswater Bay thickened to medium first-year ice. The majority of the pack ice was a combination of grey-white and thin first-year ice, with the highest concentrations closer to the coast. Peak ice in Labrador usually occurs in the middle of February. That was delayed 2 weeks this year due to the slower ice growth that occurred during the early part of the season. The maximum ice coverage of 22.1% put the 2019/20 ice season as the fifth lowest maximum ice extent seen since the 1968/69 season and the lowest since the

2012/13 season. The month finished out with a slight decrease in coverage as the ice edge retracted westwards due to strong easterly winds. The pack ice offshore became predominantly first-year ice with of up to 2 tenths of medium first-year ice. Ice further south, in the Strait of Belle Isle remained a combination of grey-white and first-year ice.

The first few days of February saw ice grow along and east of the Northern Peninsula, all young ice. Some coastal new ice in concentrations of 1-3 tenths developed along the northeast coast. This growth occurred roughly three weeks later than the climate median of mid-January. By the 10<sup>th</sup> of February, ice cover spread south as far as 50N, mainly in concentrations of 2-8 tenths. There was a small amount of thin first-year ice present in the pack ice northeast of St. Anthony; otherwise, the majority of ice was grey and grey-white thickness. Ice cover by the 10<sup>th</sup> of February was 2.9% covered, well below the normal 6.9%.

Usually ice cover in Newfoundland hovers between 10.4% to 11.1% ice covered from mid-February to the end of March. The last two weeks of February saw the continued slow growth of ice along the ice edge but remained well below normal. Ice cover pushed south to 49N and as far east as 50W by the 24<sup>th</sup> of the month. Ice along the northeast coast was mainly new and grey and in low concentrations. Ice in the pack remained predominantly grey-white thickness, a full category thinner than the climatological ice expected (thin first-year), and growth remained 3 weeks behind normal. The month ended with near 6.4% ice covered, below the normal of 11.0%, with ice retracting further west to 49W due to the development of some onshore winds pushing the ice westwards.

### **March Ice Conditions**

The ice off Labrador went through its usual expansion and contraction in the month of March due to wintertime low-pressure systems crossing the region. Ice cover fluctuated between 15.9% and 18.7% through the entire month of March. Through that same time ice cover was 3 to 6% below the climate normal. By the end of the month, the ice cover caught up to the historical mean of 18.7%.

By mid-month ice along much of the coast of Labrador was predominantly medium first-year ice, while ice in the Strait of Belle Isle thickened to predominantly thin first-year ice. In the last half of the month the first traces of old ice began to flow from the north in the pack ice offshore of the Labrador coast in the northern section. By the end of the month the trace of old ice was as far south as 55N.

March typically sees stable ice cover in Newfoundland. This year did not follow that trend as the month started out near 6.4% ice covered. A slight uptick in cover to 7.0% occurred in the first week as ice slowly drifted slowly southeasterly. Ice concentrations of 3 to 8 tenths in most the Newfoundland waters, except near the Northern Peninsula where grey-white and thin first-year ice in 9 tenths concentrations flowed from the north. Ice cover increased by mid-March to 11.0%, near normal for the week. The week of March 19<sup>th</sup> ended up being the peak of ice cover for the Newfoundland waters for the 2019/20 season. 11.0% ice cover was below the longer-term maximum (since the 1968/69 season) of 15.0%. It was closer to the 10-year median of 12.4% and lower than the two previous winters. At its peak the ice stretched from Labrador to across all of northeastern Newfoundland and north of the Avalon Peninsula to 48N 49W. The main ice pack was a mixture of thin first-year ice and grey-white ice in concentrations of 8-9 tenths. Southerly winds in the third week of the month saw ice pull away from the northeast coast of the Island and concentrations decreased significantly in the ice in the most southeastern section near the Grand Banks. Ice cover dropped below normal to 7.9% then to 6.5% at

the end of the month as the ice became less concentrated. The area the ice cover was similar to the peak; however, concentrations were mainly in 4-8 tenths range instead of the higher concentrations at peak.

### **April Ice Conditions**

Significant compaction of the ice pack off Labrador happened in the first week of the month due to significant onshore winds associated with a low pressure area centered over southern Labrador. Ice cover dropped rapidly from 18.7% to 11.7% due to this compression. The trace of old ice moved further south to 53N with the mobile ice consisting mainly of medium first-year ice. Little change in ice conditions occurred in the next week in the Labrador region. By the 20<sup>th</sup> of April, ice pulled away from the coast of Labrador as winds pushed ice offshore. The trace of old ice moved as far south as 51N, staying offshore and not flowing into the Strait of Belle Isle. With the ice pulled away from the coast and rising temperatures in late April, the ice cover decreased significantly in the last week of the month to 10.0% covered, remaining below the climate median for the week. The ice pack became less compact with more areas of 4 to 7 tenths of ice than 9 tenths of ice present. Ice cover, especially south of 54N, became significantly reduced. The coastal lead that formed mid-month along the length of the coast remained. Ice in the Strait of Belle Isle decreased in concentration, became less compact, and then a bergy water area developed between the ice in the Strait and the ice offshore Labrador.

Much like Labrador, the first week of April had significant compaction of the ice pack in Newfoundland due to onshore winds. A thick band of medium first-year ice was created due to compaction along the eastern coast of the Northern Peninsula. Ice pushed back along the northeast coast and touched the northern portion of the Avalon Peninsula for the first time of the season. Ice cover dropped to 4.3% due to the compaction, with ice melt roughly one week ahead of normal. Warming temperatures in the first half of April continued with the ice loss in the Newfoundland waters. Ice pulled away from the northeast coast in the second week with a thick band of medium first-year ice remaining near the eastern half of the Northern Peninsula. Over two degrees of latitude of ocean lost ice cover as ice disappeared south of 50N. Ice melt remained roughly 1-2 weeks ahead of normal through the month of April. Concentrations reduced further in the third week. Towards the end of the month, there was a significant loss of most extent and concentration of ice. Ice near and east of the Northern Peninsula became detached from the ice flowing from Labrador from the north. Concentrations decreased to smaller patches of 5-7 tenths medium first-year ice. Ice cover decreased to 1.0% at the end of the month, below the climate median of 2.7%.

### **May Ice Conditions**

The first week of May had a diminishment of ice from 52N and south. Within the first 10 days of May the ice in the Strait of Belle Isle melted out. Ice cover fell to 8.8% after the first week. Significant compaction and diminishment of ice occurred during the second week of the month. By mid-month, ice was entirely confined along the coast, north of Groswater Bay, with fast ice present in Lake Melville and Sandwich Bay. Ice cover fell to 3.6%, well below the climate median of 11.3%. Little change in ice cover occurred for the rest of the month, with ice cover hovering around 2.8% covered. The main change in ice during the last two weeks of the month was the fracture of the fast ice in Lake Melville and Sandwich Bay. At the end of May Lake Melville was half filled with ice.

Newfoundland waters started out near 1.0% coverage at the start of the month, with the only ice remaining as a small patch of ice east of Belle Isle and a small amount of fast ice along the Northern Peninsula. Ice melted by the end of the first week with no further ice moving into the Newfoundland waters for the season.

### **June Ice Conditions**

The Labrador ice continued its very slow melt of ice in the first week of June. Ice in Lake Melville fully melted at the end of the first week. Ice coverage remained steady near 2.4%, lower than the 4.5% climate median. After the first week ice cover remained steady between 1-2% ice covered through the end of June as ice continued to drift slowly from the north before melting near or north of Groswater Bay.

### **July Ice Conditions**

The final melt of ice in southern Labrador occurred in the first few days of the month of July.

TAC for the Southern Labrador Sea ended the 2019-2020 season at 8.18%. This puts the season as the 6<sup>th</sup> lowest TAC recorded since the 1968-1969 season, and the lowest since the 2012-2013 season.

TAC for the East Newfoundland waters ended the 2019-2020 season at 1.9%, less than half of the climate median of 4.0%. This puts the ice season as the 11<sup>th</sup> lowest TAC on record since the 1968-1969 season, and the lowest TAC since the 2012-2013 season.

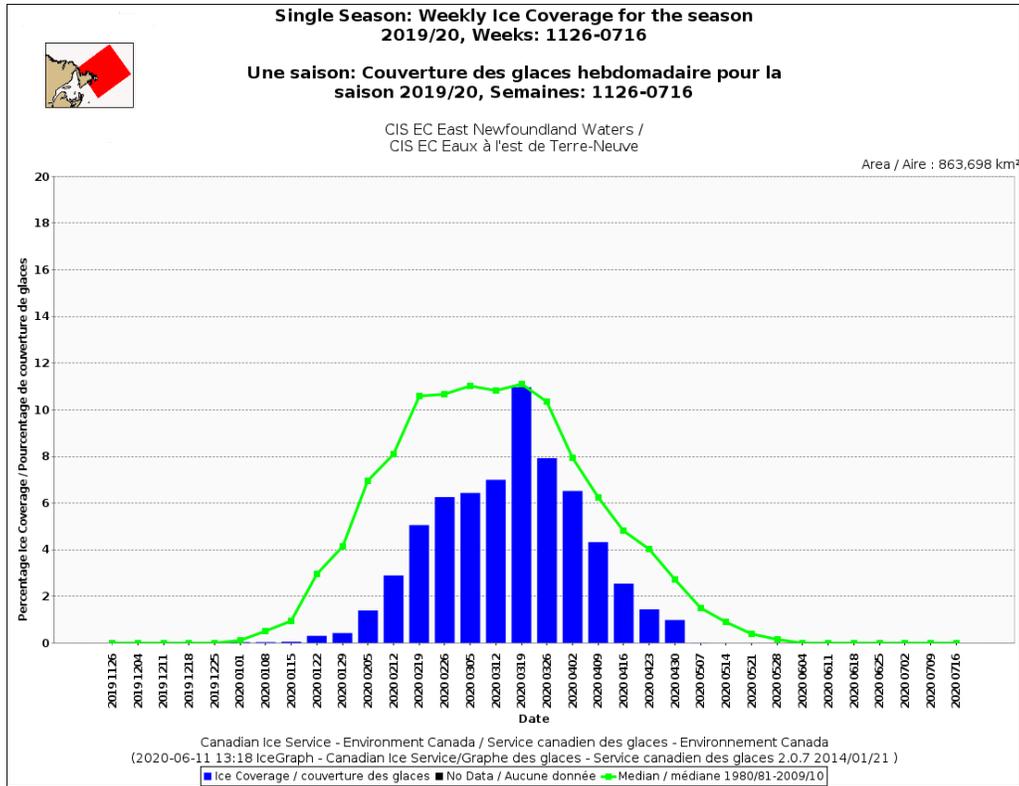


Figure 17: Weekly Ice Coverage for the 2019-2020 Season in Newfoundland

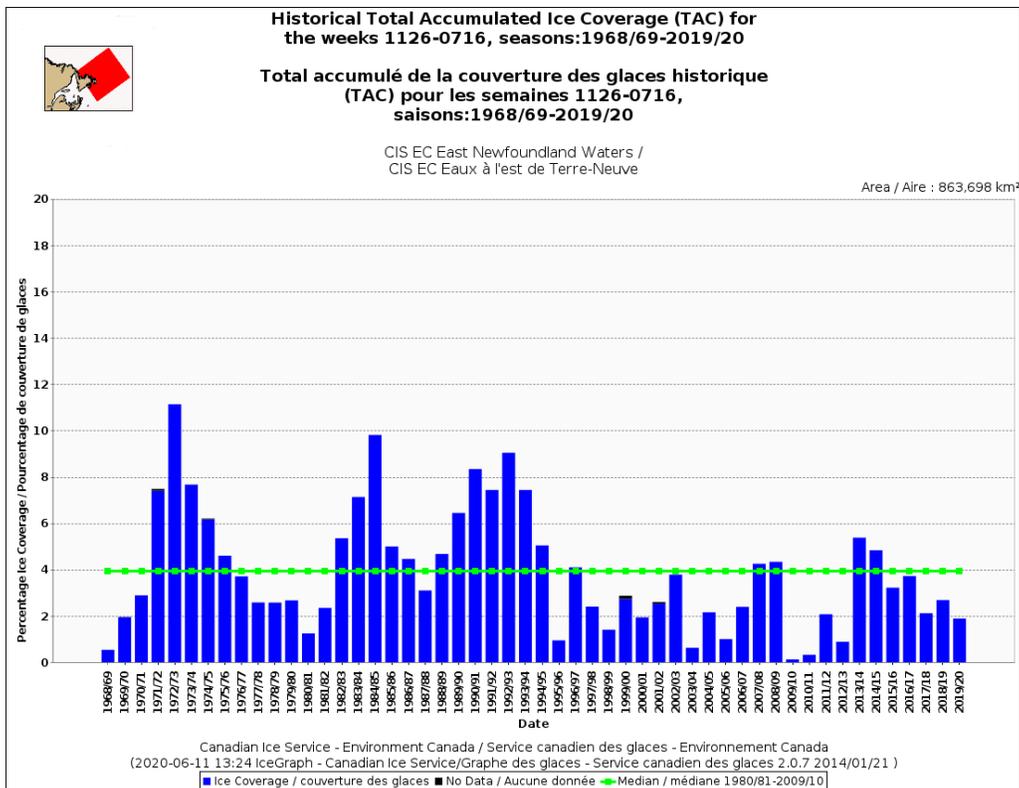


Figure 18: Historical Total Accumulated Ice Coverage Newfoundland Waters by Season, 1968-2020

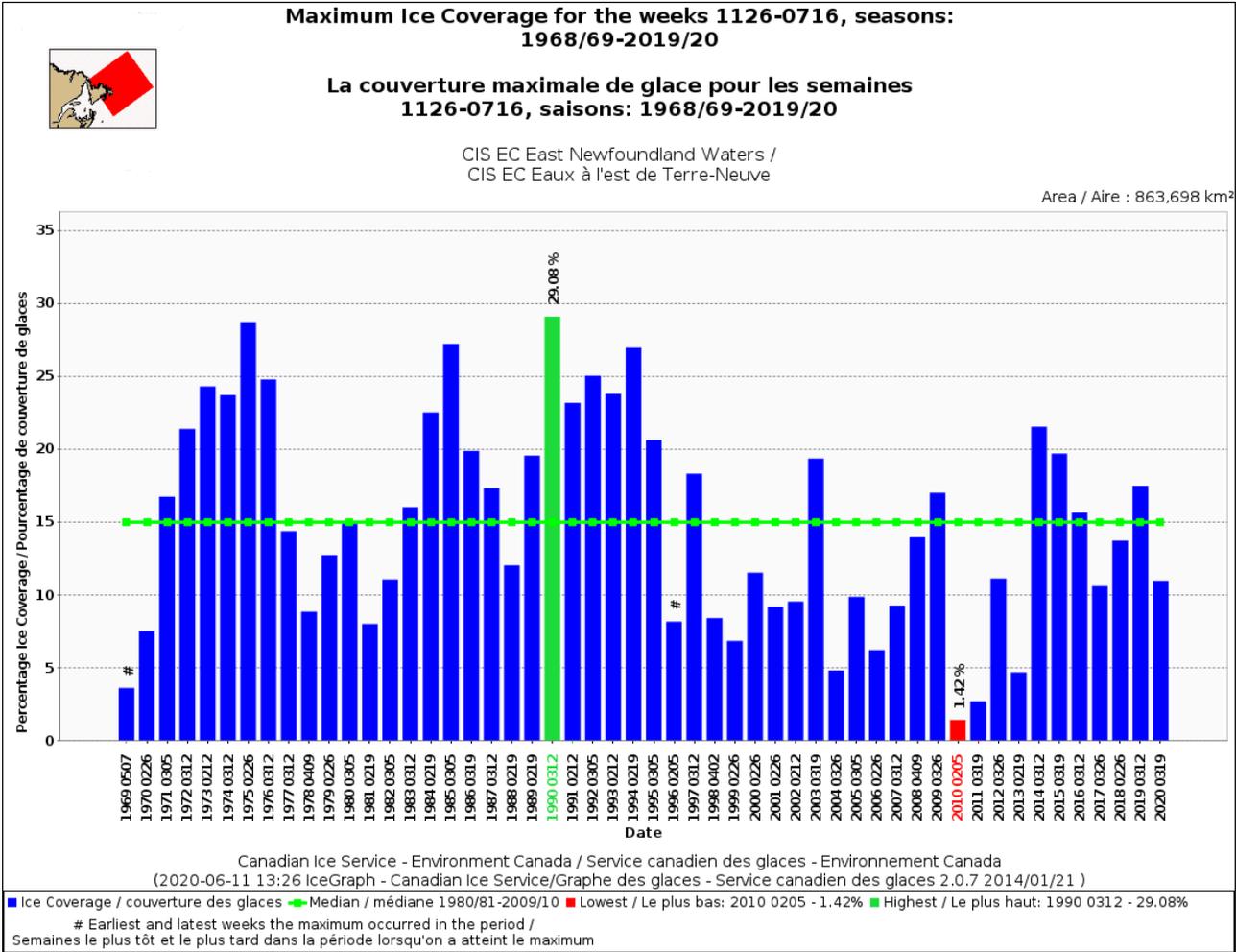


Figure 19: Maximum Ice Coverage in Newfoundland waters by Season, 1968-2020

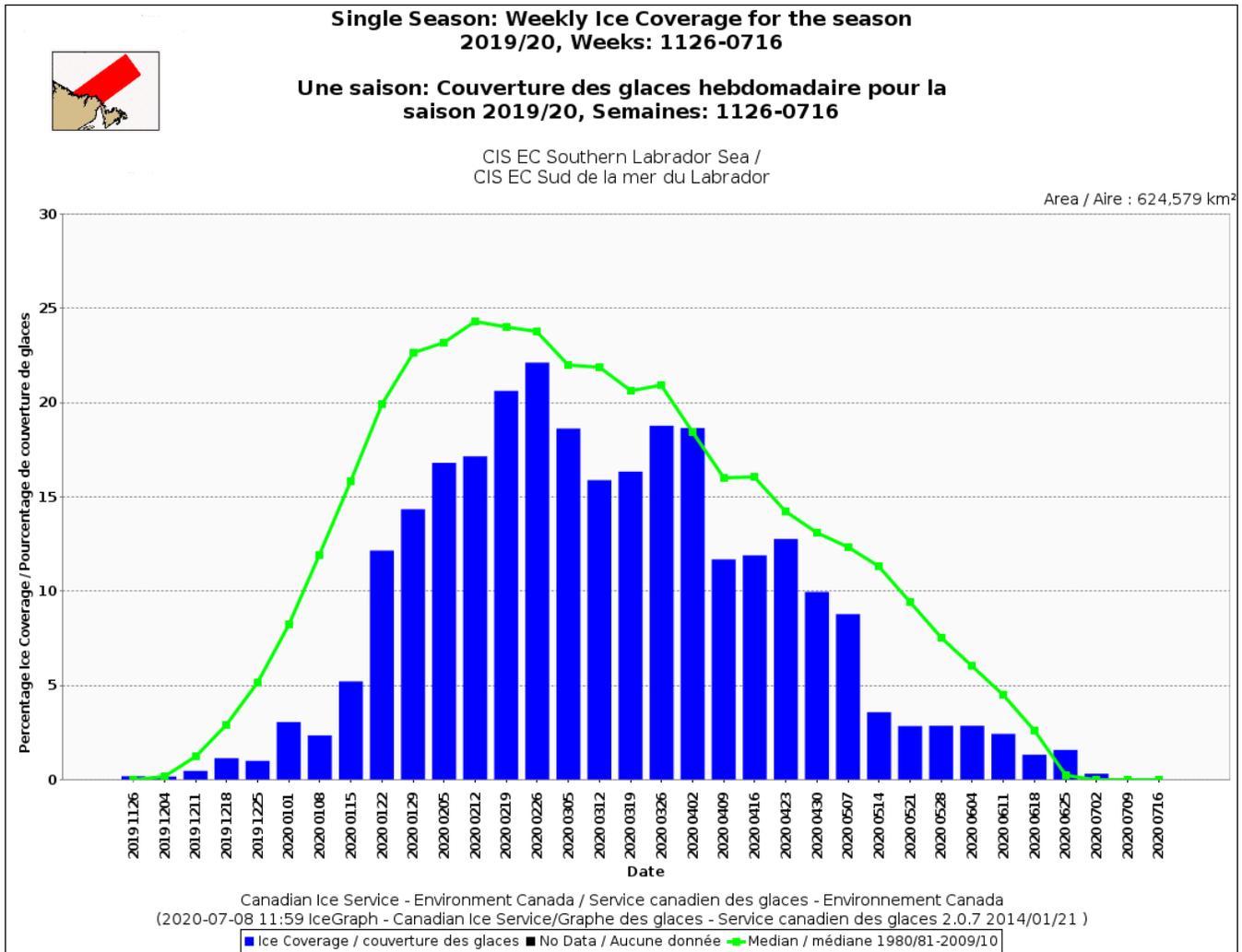


Figure 20: Weekly Ice Coverage for the 2019-2020 Season in the Southern Labrador Sea.

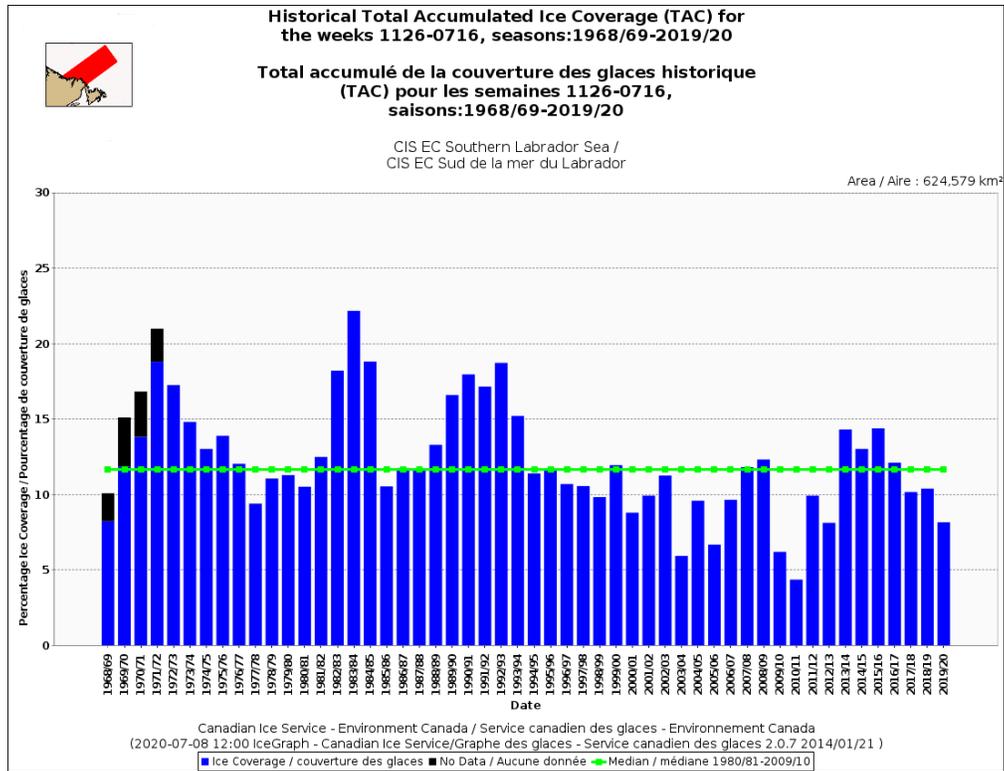


Figure 21: Historical Total Accumulated Ice Coverage for the Southern Labrador Sea by Season, 1968-2020

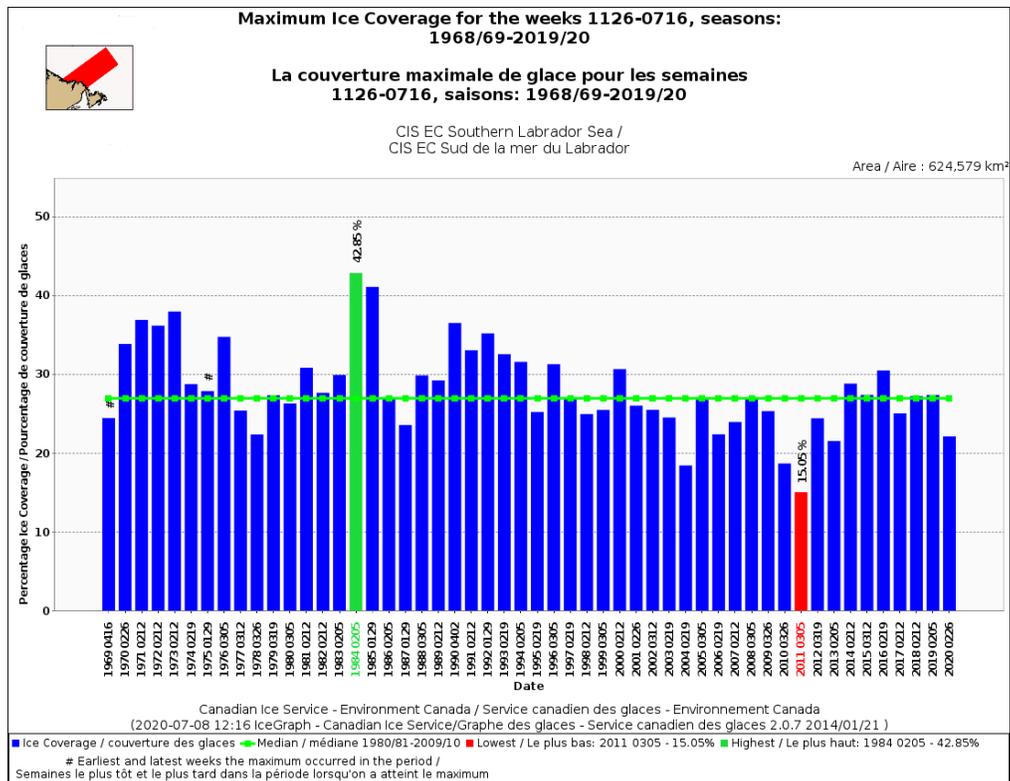


Figure 22: Maximum Ice Coverage in the Southern Labrador Sea by Season, 1968-2020

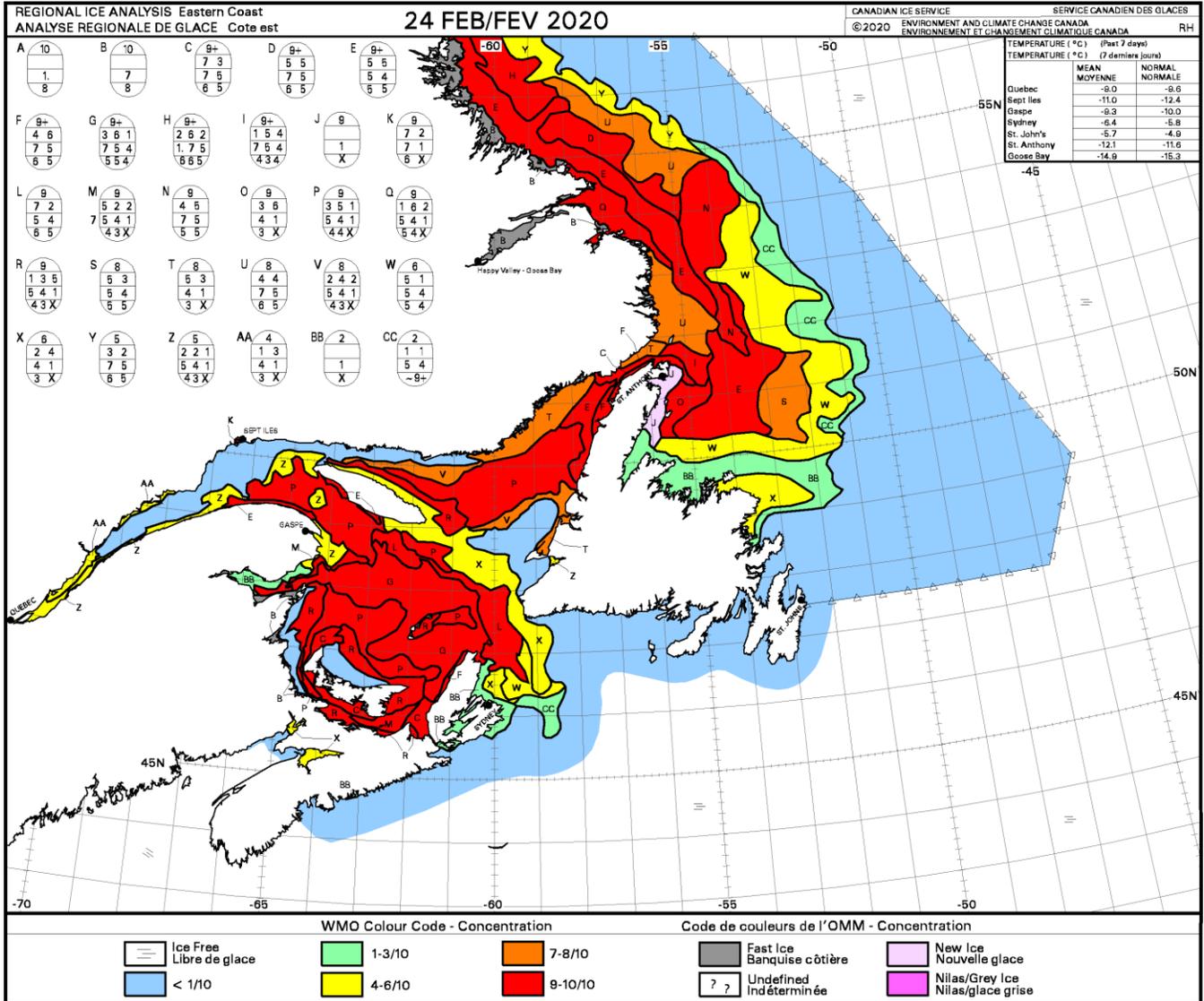


Figure 23: Maximum Ice Cover, Eastern Coast Regional Ice Chart – February 24, 2020.