



Seasonal Summary

Eastern Canada

Winter 2020-2021

By



Canadian Ice Service
Le service canadien des glaces



Summary for the East Coast

The 2020-2021 East Coast ice season can be defined as a well below normal season in terms of ice coverage and thickness. Ice coverage did not follow the typical seasonal trend, but remained low through the start of the season to early-February, even near record lows during some weeks. Ice did accumulate through February and the ice extent peaked in early-March, followed by the spring melt that lasted into mid-June. Ice coverage remained at less than half of climatological values for nearly the entire season.

The season started in on time in early to mid-November with the arrival of slightly below normal air temperatures along the Labrador coast. This led to the formation of the first sea ice for the season along the mid-Labrador coast and in Lake Melville. Ice growth did not progress much in the end of November as above normal air temperatures settled over the East Coast, in fact, the ice coverage shrunk slightly in the beginning of December. These above normal air temperatures persisted through the early part of the winter to the first half of February. During this period, very little ice formed, with ice coverage remaining between 1-2.5%, setting a new record low ice coverage for three weeks in January.

In the second half of February, there was a brief reprieve from the warm spell, when near normal average air temperatures returned to the East Coast. The return of colder air to the region allowed ice to steadily grow in February and reaching the peak ice extent of 9.2% in the first week of March. Despite the peak occurring the same week of the climatological peak, it was less than half of the climatological value of 23%.

Following the peak ice coverage in early-March a strong low-pressure system in the second week of March caused a sudden drop in ice coverage, down to 5.6%, destroying much of the thinner ice that had formed in the Gulf. In the wake of the low-pressure system, the Labrador coast and the Gulf of St. Lawrence experience the only sustained period of below normal average air temperatures, lasting just 1 week. While ice coverage did slightly rebound to 7.8%, the spring melt continued uninterrupted after that, progressing nearly 5 weeks ahead of the median for ice melt through mid-March and April. The advanced ice melt once again set record low ice coverage for the East Coast during 4 consecutive weeks from mid-April to early-May.

By early-May, average air temperatures return to near normal where the Gulf of St. Lawrence and the waters around Newfoundland became ice-free. The rapid ice melt slowed significantly as the remaining sea ice along the mid-Labrador coast was being replenished by the continuous southward migration of the ice through the Labrador Sea. It wasn't until mid-June that the last of the sea ice just north of Groswater Bay finally melted, bringing an end to the 2020-2021 ice season 3 weeks earlier than the long-term median.

The season TAC (Total Accumulated Ice Coverage) for the 2020-2021 season was 2.5%. This is the 3rd lowest TAC since the 1968-1969 season, only being surpassed by 2010-2011 as the lowest and 2009-2010 as the second lowest on record.

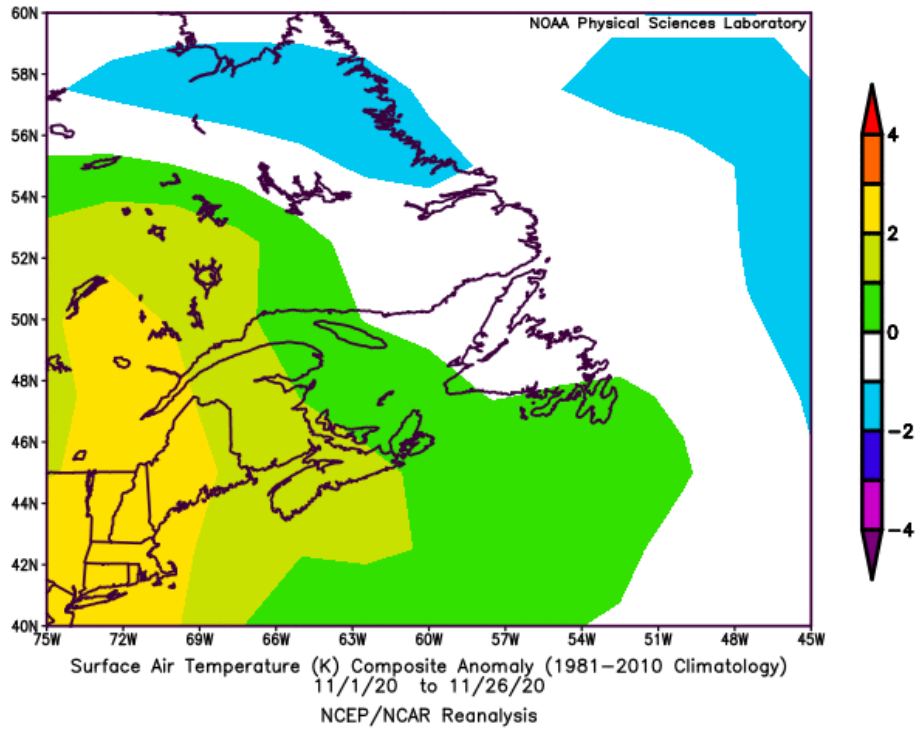


Figure 1: Surface Air Temperature Anomaly - November 1, 2020 to November 26, 2020.

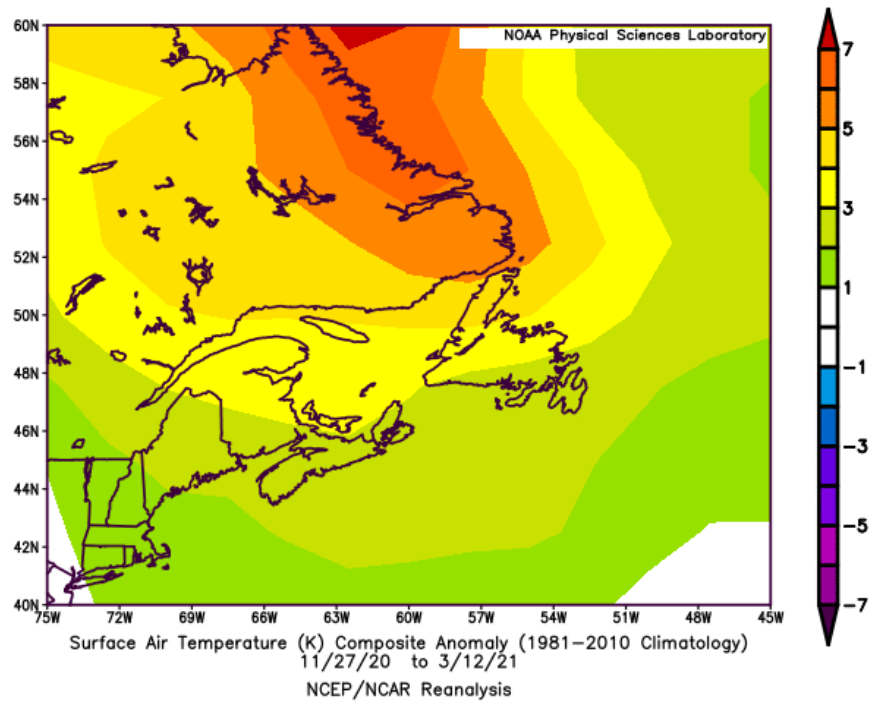


Figure 2: Surface Air Temperature Anomaly - November 27, 2020 to March 12, 2021.

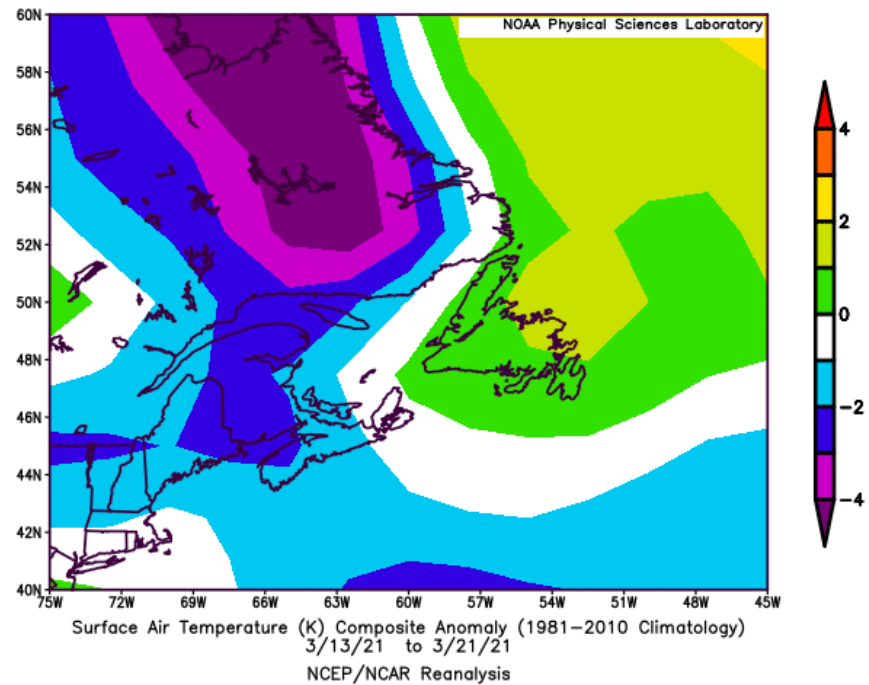


Figure 3: Surface Air Temperature Anomaly - March 13, 2021 to March 21, 2021.

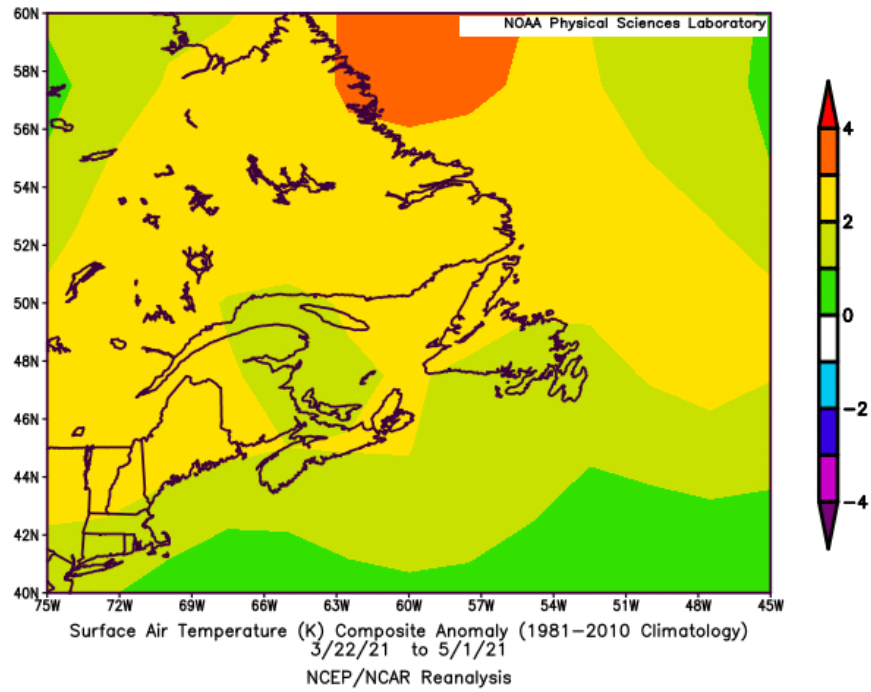


Figure 4: Surface Air Temperature Anomaly - March 22, 2021 to May 1, 2021.

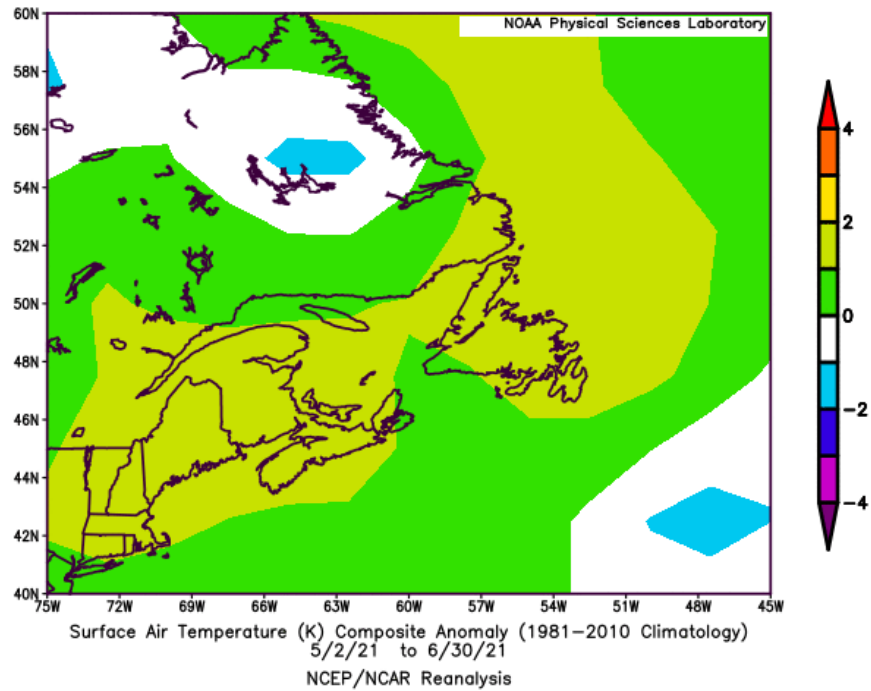


Figure 5: Surface Air Temperature Anomaly - May 2, 2021 to June 30, 2021.

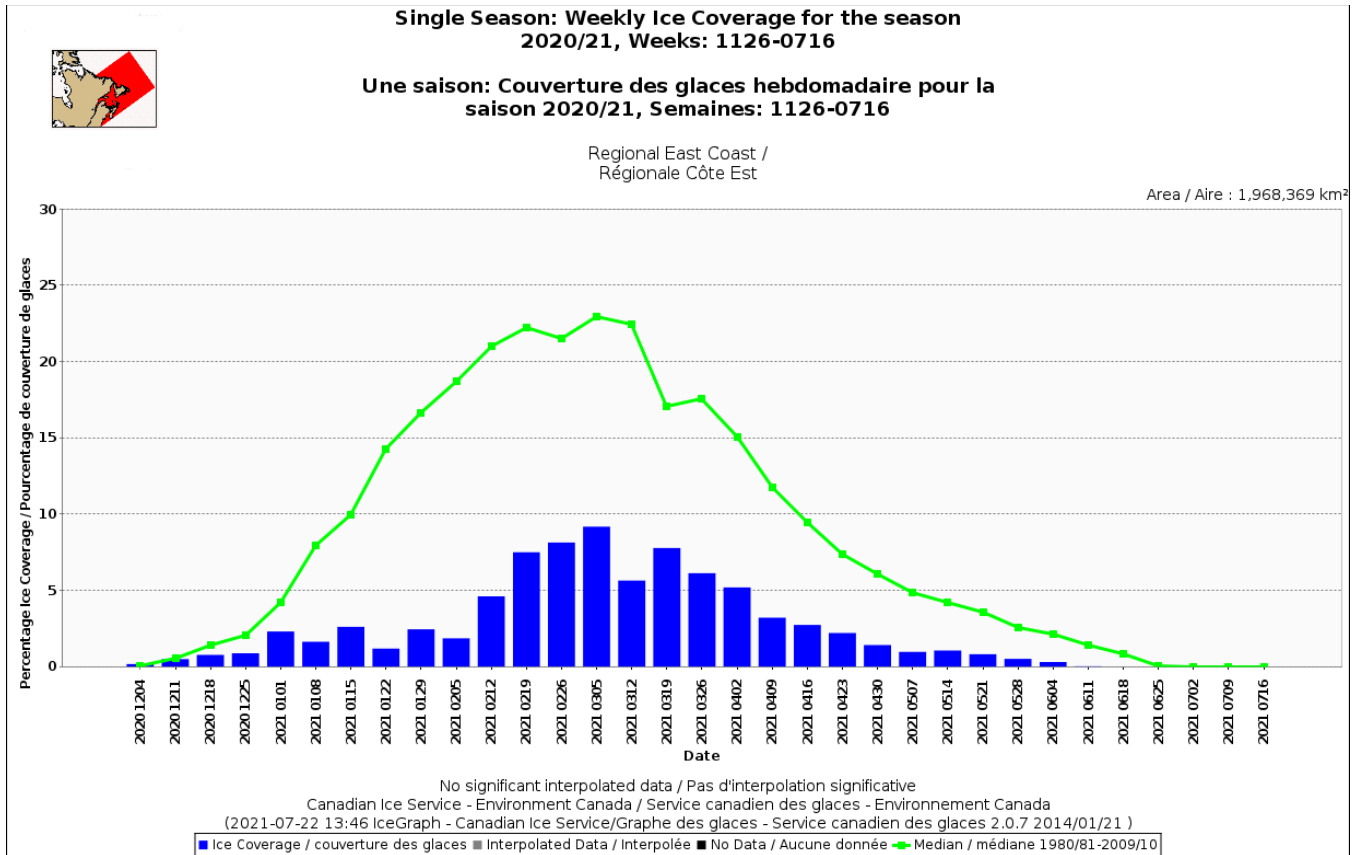


Figure 6: Weekly Ice Coverage for the 2020-2021 Season for the East Coast.

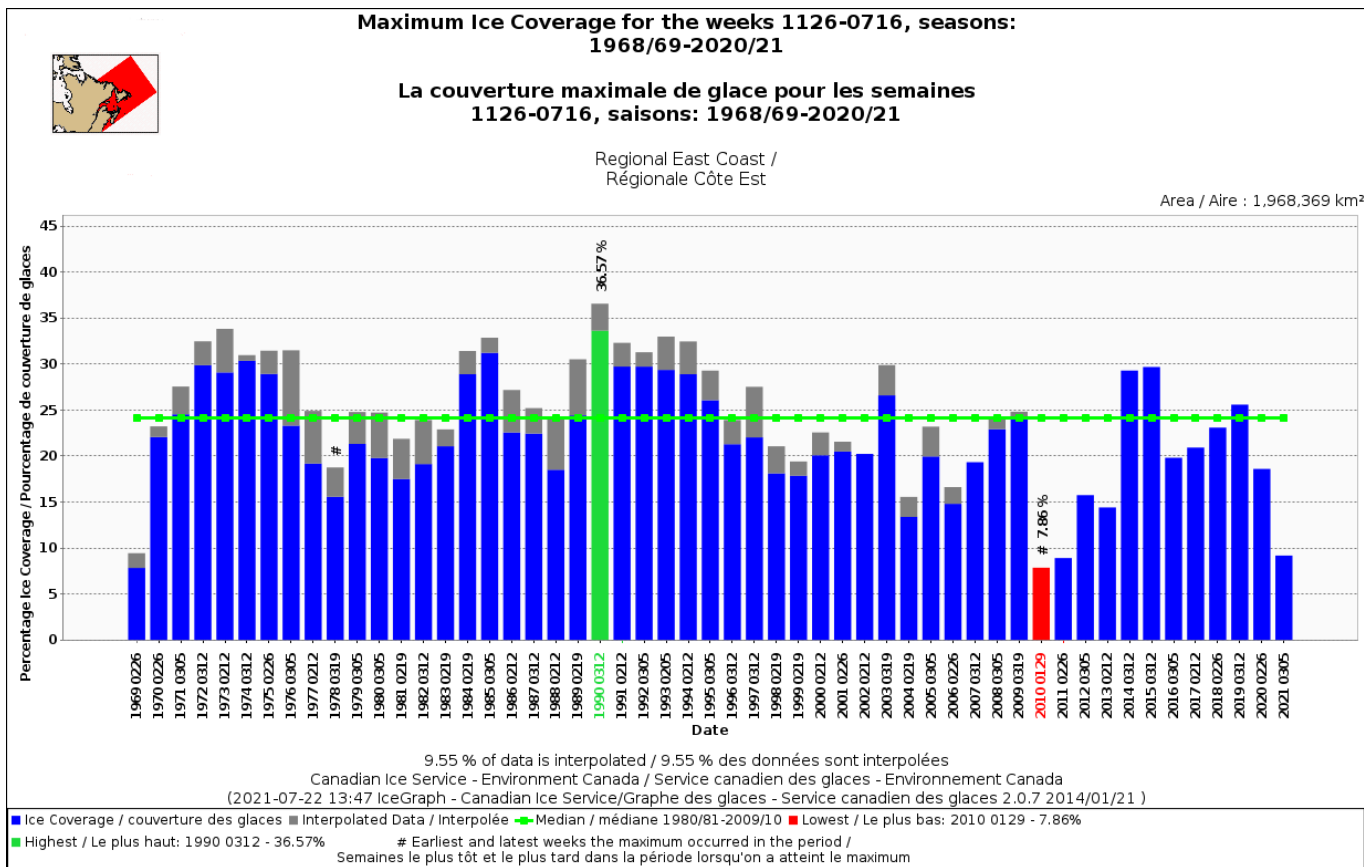


Figure 7: Maximum Ice Coverage for the East Coast by Season, 1968-2021

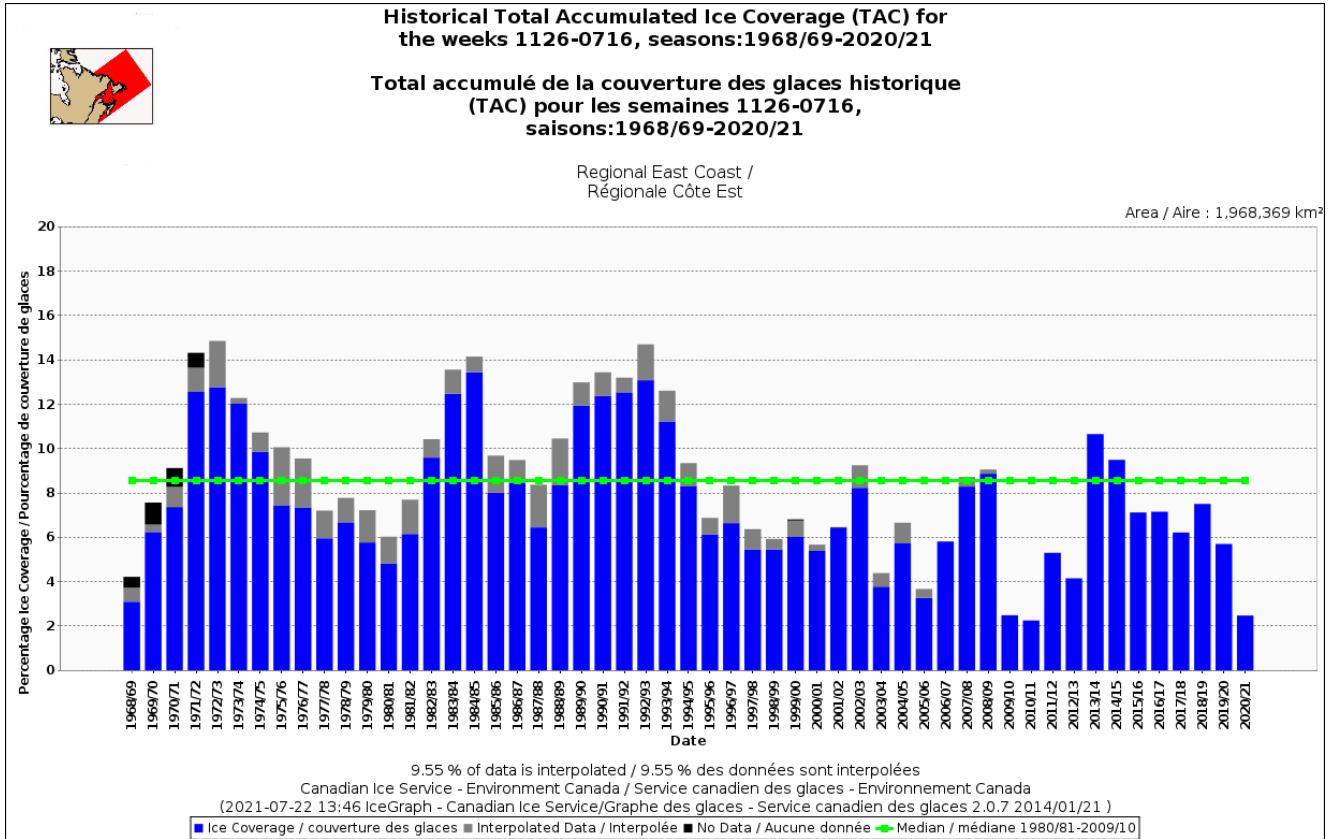


Figure 8: Historical Total Accumulated Ice Coverage for the East Coast of Canada by Season, 1968-2021

Gulf of St Lawrence

2020-2021 Season temperature: November to May

November started out the 2020-2021 ice season with near normal average air temperatures for the Gulf of St. Lawrence. These seasonal temperatures lasted through most of the month of November, with the southwestern half of the Gulf being slightly warmer than the northeastern half.

In the last week in November, above average surface air temperatures were ushered into the region and remained there until early-February. Surface air temperatures were around 4-5 degrees Celsius above average during this period. While, there were short periods of below average or near normal air temperatures during this time, none of these episodes lasted more than one or two days. The warmest anomalies for this period were along the Lower North Shore of Quebec and into the Estuary, while the coldest anomalies were in the southeastern section of the Gulf. Along the Lower North Shore, average air temperatures were frequently over 10 degrees Celsius above normal through January.

In early-February, average air temperatures moderated slightly, lasting into mid-March. Near normal average air temperatures returned to the southwestern half of the Gulf of St. Lawrence. Air temperatures of near 3-4 degrees Celsius above average remained in the northeastern half of the Gulf; however, the anomaly was not as high as it had been in the previous 2.5 months.

In mid-March, in the wake of a strong low-pressure system and for the first time during the 2020-2021 ice season, a sustained period of below normal average air temperatures affected the western half of Gulf. Northwesterly winds brought air temperatures of 2-3 degrees Celsius below normal. Despite the cold temperatures, the strong winds prevent any ice from forming; rather the winds destroyed much of the mobile ice in the southern Gulf. The eastern half of the Gulf was spared the below average temperatures and recorded temperatures closer to normal.

By late-March, following the brief cold spell, above normal average air temperatures returned, blanketing the Gulf with temperatures near 1-3 degrees Celsius above the long-term average. These above average temperatures continued in early and mid-April; this is also when average daily air temperatures rise above zero degrees Celsius for most of the Gulf. The above average air temperatures in April, coupled with the already very low ice conditions, lead to a very early end to the 2020-2021 ice season.

November Ice Conditions

The first formation of ice occurred on November 25th when new ice formed along the Lower North Shore between Sept-Iles and Natashquan, as well as along the shore of Anticosti Island after a week of slightly below normal average air temperatures. This ice remained in place through the final week of the month, some additional formation occurred along the shore east of Natashquan, but the ice did not thicken as generally above normal temperatures returned in the last few days of the month.

December Ice Conditions

In early December, with above average temperatures firmly in place, the new ice extent reduced to a few small coastal areas along the Lower North Shore. Within a few days, these small areas continued to melt, leaving mainly just strips and patches of new ice occurring either from fresh water sources or in areas where overnight low temperatures allowed for the brief formation of new ice. Briefly, on December 11th, no ice was recorded at all in the Gulf of St. Lawrence. Areas of new ice began to reform in mid-December during a brief 2-day cold spell, with new ice forming once again along the

Lower North Shore and for the first time along the shores in the Estuary, New Brunswick and Prince Edward Island. These areas of new ice continued to grow through mid-December and even thickening to grey ice in parts. By late-December, significantly above normal air temperatures cause the sea ice to melt once again, leaving isolated patches of new and grey ice along parts of the shore. Through the second half of December, ice coverage remained near 1%, which is typical for that time of year.

January Ice Conditions

Ice conditions remained nearly static during the first week of the month as new and grey ice remained along the western and northern shores of the Gulf. By the second week, mobile ice branched out and began to form in the middle of the Estuary and grey ice filled Miramichi Bay. In the third week, the ice extent actually reduced to just 0.5% compared to the climatological mean of 15%, much more typical of mid-December than mid-January. The rest of January saw some concentrations of ice form and melt between periods of near and above normal temperatures. New and grey ice temporarily filled the Estuary and formed in Northumberland Strait while also lining much of the western and northern shores. The first ice within the Magdalen Islands had also finally formed. By then end of the month, the ice coverage over the Gulf of St. Lawrence still had not reached the climatological mean for the beginning of January, 4.2% compared to 4.7%.

Ice coverage did not grow as expected, base on climatology, through the month of January. The ice extent started the month at 1% and progressed to only 4.2% by the end of January, compared to the long-term median of 4.7% ice covered at the beginning of the month and 32.9% at the end of the month. The ice coverage during the last two weeks of the month even set new record low ice coverage for the Gulf of St. Lawrence, all due to the well above normal temperatures affecting the region.

February Ice Conditions

The first few days in February saw ice coverage increase slightly as grey and grey-white ice filled most of the Estuary, Chaleur Bay and the western half of Northumberland Strait. The eastern half of the Gulf remained open water except for some consolidated ice along the Lower North Shore, east of Natashquan. There was still no mobile ice in the northeast arm of the Gulf. This small surge did not last long so that by the end of the first week of the month, most of the mobile ice had melted through the Estuary and much of the ice along the New Brunswick shore was reduced to low concentrations. The ice coverage shrank from the week before, down to 1.2%, well below the median of 31.8%, once again setting a new record low ice coverage for that week.

In the second week, average air temperatures moderated slightly and trended closer to near normal values. This allowed ice to finally bloom, expanding quickly to fill Northumberland Strait and the New Brunswick shore with new and grey ice. By the end of the second week, Chaleur Bay and the New Brunswick shoreline were filled with new and grey ice while Northumberland Strait was filled with grey and grey-white. Further north, the Estuary had high concentrations of grey and grey-white ice, though there were still large areas of open water. Small concentrations of grey ice could also be found along the Lower North Shore. Ice coverage had jumped to 8.4% and despite this large jump, ice coverage was still less than one quarter of where it should have been 40%, for that time of year.

During the third week of February, ice coverage continued to increase, filling more of the Estuary, growing along the Lower North Shore, spreading across the northern shore of Prince Edward Island and reaching almost to Cape Breton Island and also expanding eastward in Northumberland Strait, past Cape George. At the same time, the first ice formed and expanded quickly in the Strait of Belle Isle and in the bays along the Newfoundland shore. The majority of the ice had thickened to grey and grey-

white, with even some areas of predominantly grey-white ice along the western Prince Edward Island coast and western Northumberland Strait. Ice coverage had once again grew 11.3%, falling well short of the median of 40.9%.

Ice concentrations decreased in the final week of the month as a low-pressure system brought warm air and high winds to the region compressing ice in the western Gulf and destroying much of the new ice. This left predominantly grey-white ice through much of the western Gulf, Northumberland Strait and in the Estuary. While ice decreased slightly in the Northeast Arm, grey-white and the first hints of first-year ice continued to stream in from the Strait of Belle Isle. Ice coverage fell to 9.5%; a small decrease is normal for the last week in February as this is usually when the first spring like low-pressure system arrives to the area.

March Ice Conditions

The first week in March saw the largest weekly increase in ice coverage for the season as coverage jumped to 16.8%. This was caused by near to below normal temperatures in the extreme southwestern portion of the Gulf. The mobile ice expanded eastward to fill most of the southern half of the Gulf, from Gaspe to the Magdalen Islands to the northern tip of Cape Breton and south. The ice was mainly a mix of grey and grey-white ice with some first-year ice embedded within the pack. During this first week, small concentrations of grey and grey-white ice also spread into Cabot Strait. Ice condition actually deteriorated in the northern half of the Gulf where above normal temperatures dominated and ice was mainly restricted to the shores of the Estuary and the Northeast Arm. Small amounts of new and grey ice formed and melted along the Newfoundland shore. This jump in ice coverage marked the peak for the 2020-2021 ice season, which occurred during the same week as the climatological peak, however, it was much lower than the median of 41.8%.

In the second week of March, another low-pressure system brought warm southwesterly winds followed by strong, cold northwesterly winds for several days. The warm southwesterly winds quickly melted much of the new ice that formed in the previous week in the southern Gulf, Estuary and Northeast Arm. As winds switched and strengthened from the northwest, large amounts of ice were destroyed due to wind and wave action despite the cold, below average air temperatures. This reduced ice coverage to a small amount of grey-white and first-year ice through the southern Gulf, mainly compacted against the Prince Edward Island shore and Cape Breton. Meanwhile, through the Estuary, Lower North Shore and the Northeast Arm, some new ice did form among the traces of first-year ice close to the shores where the winds remained light. By the end of the second week, the ice extent fell to 2.6%; a significant reduction from the previous week.

Ice conditions rebounded in the following week as winds lightened and slightly below normal air temperatures continued. Large areas of new ice formed, covering much of the southern half of the Gulf and parts of the Northeast Arm. This rapid growth only lasted a few days as another low-pressure system crossed the Gulf by the end of the third week, erasing the new ice that had formed, leaving once again, a mix of grey, grey-white and first-year ice through parts of the southern Gulf and in the Northeast Arm. Ice conditions in the Estuary and along the Lower North Shore reduced slightly during the week leaving only strips of new and grey ice. Ice coverage did rise to 4% in the third week, though this number would have been much higher had it been calculated earlier when the new ice had first formed.

The end of March saw most of the mobile ice in the Gulf melt out as persistent above normal temperatures returned to the region. The Estuary and the northern half of the Gulf became open water with only occasional strips of new ice forming on the colder calm nights. The southern half of the Gulf

lost the bulk of the mobile ice, leaving patches of first-year ice along parts of the shore. Much of the fast ice along the Prince Edward Island and New Brunswick shores also fractured and began to melt out. In the Northeast Arm of the Gulf, small concentrations of new ice remained along the Quebec shore and the fast ice continued to fracture. Ice coverage fell compared to the week before, down to 0.9%. Typically, the end of March and early April see rapid decline in ice coverage as the vast areas of mobile ice melt, however, due to the already very low ice extent, ice conditions were much more typical of early to mid-May.

April Ice Conditions

The first week in April saw the continued decline of what little ice was still left in the Gulf. Ice-free conditions expanded through the central and northern portions of the Gulf as well as the Estuary, as air temperatures remained near or above 0 degrees Celsius. The rest of the mobile ice in the southern Gulf and Northeast Arm also melted during this first week, leaving only fast ice in small bays along the shore of northern New Brunswick and along the Quebec shore in the Northeast Arm. Ice coverage had reduced to 0.2%.

Through the second week, the fast ice along the New Brunswick shore and along the Quebec shore in the Northeast Arm continued to break up and melt, while the rest of the Gulf was ice-free. For the first time since mid-March, concentrations of 5-9 tenths medium first-year ice entered the Northeast Arm of the Gulf from the Strait of Belle Isle. The addition of ice from the Strait of Belle Isle kept ice coverage nearly the same, with ice coverage hovering around 0.1%. This injection of ice did not last long, however, as the winds changed direction and cut off the flow of ice from the Strait of Belle Isle and it quickly melted along the Quebec shore just west of Blanc Sablon by the end of the third week. Along with it, the rest of the fast ice melted out along the New Brunswick shore and in the Northeast Arm, leaving the Gulf free of ice.

The Gulf was official ice-free on April 21st, leading to the earliest end to the ice season on record since 1968-1969. The TAC for the 2020-2021 Gulf of St. Lawrence ice season was 1.99%, nearly a tenth of the long-term median of 12.7%. This places the 2020-2021 ice season as the second lowest on record, with only the 2009-2010 ice season being lower, with a TAC of 1.89%.

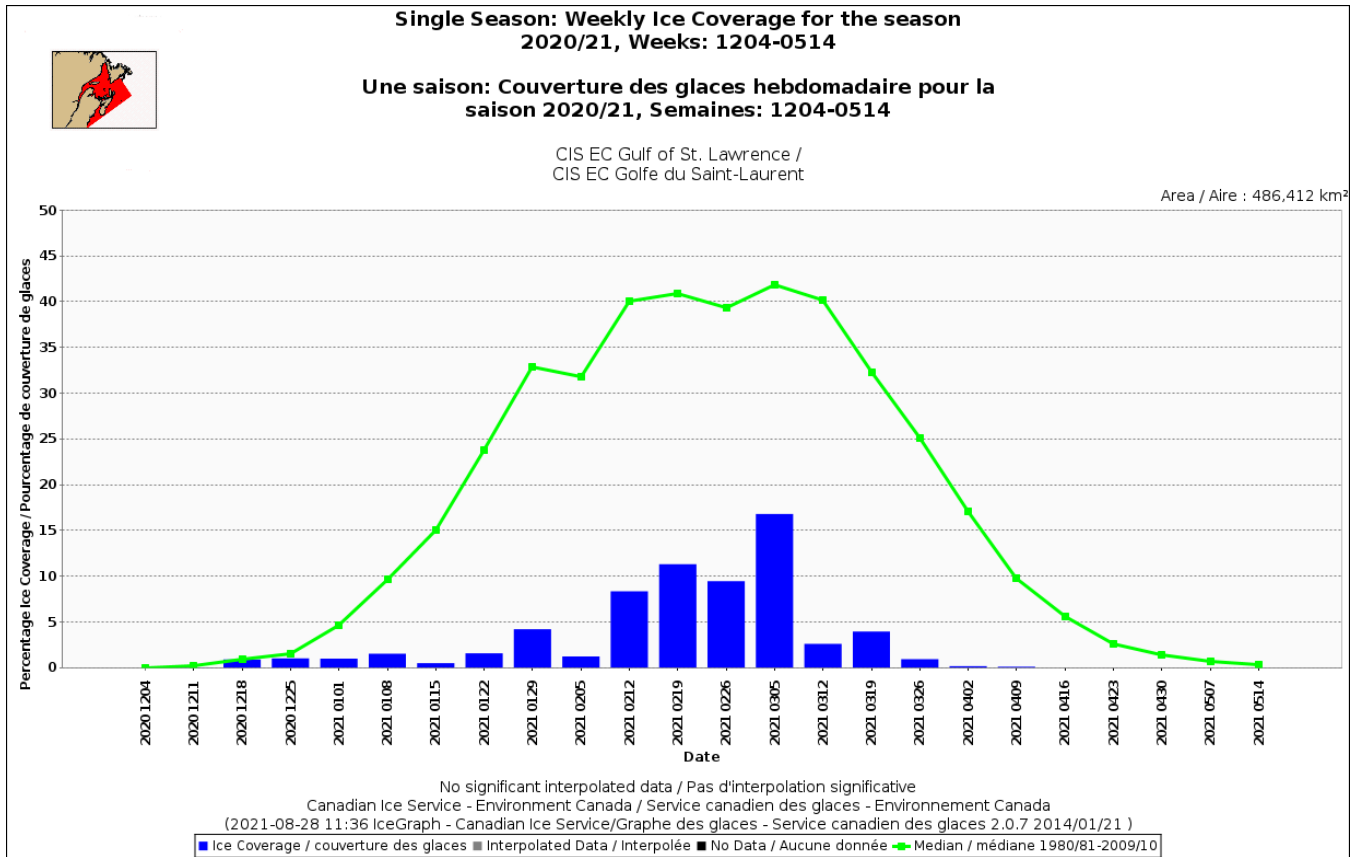


Figure 9: Weekly Ice Coverage for the 2020-2021 Season in the Gulf of St. Lawrence

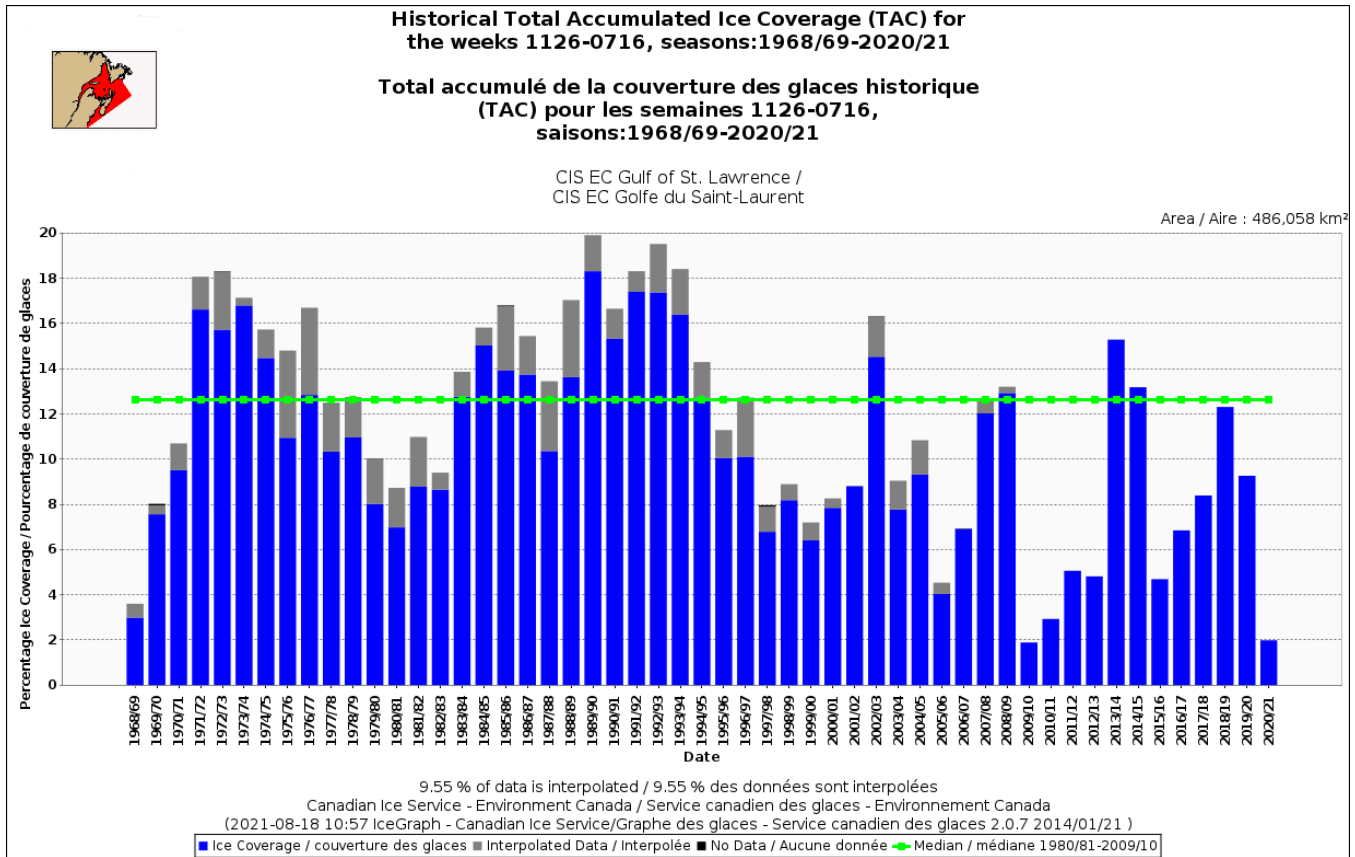


Figure 10: Historical Total Accumulated Ice Coverage for the Gulf of St. Lawrence by Season, 1968-2021

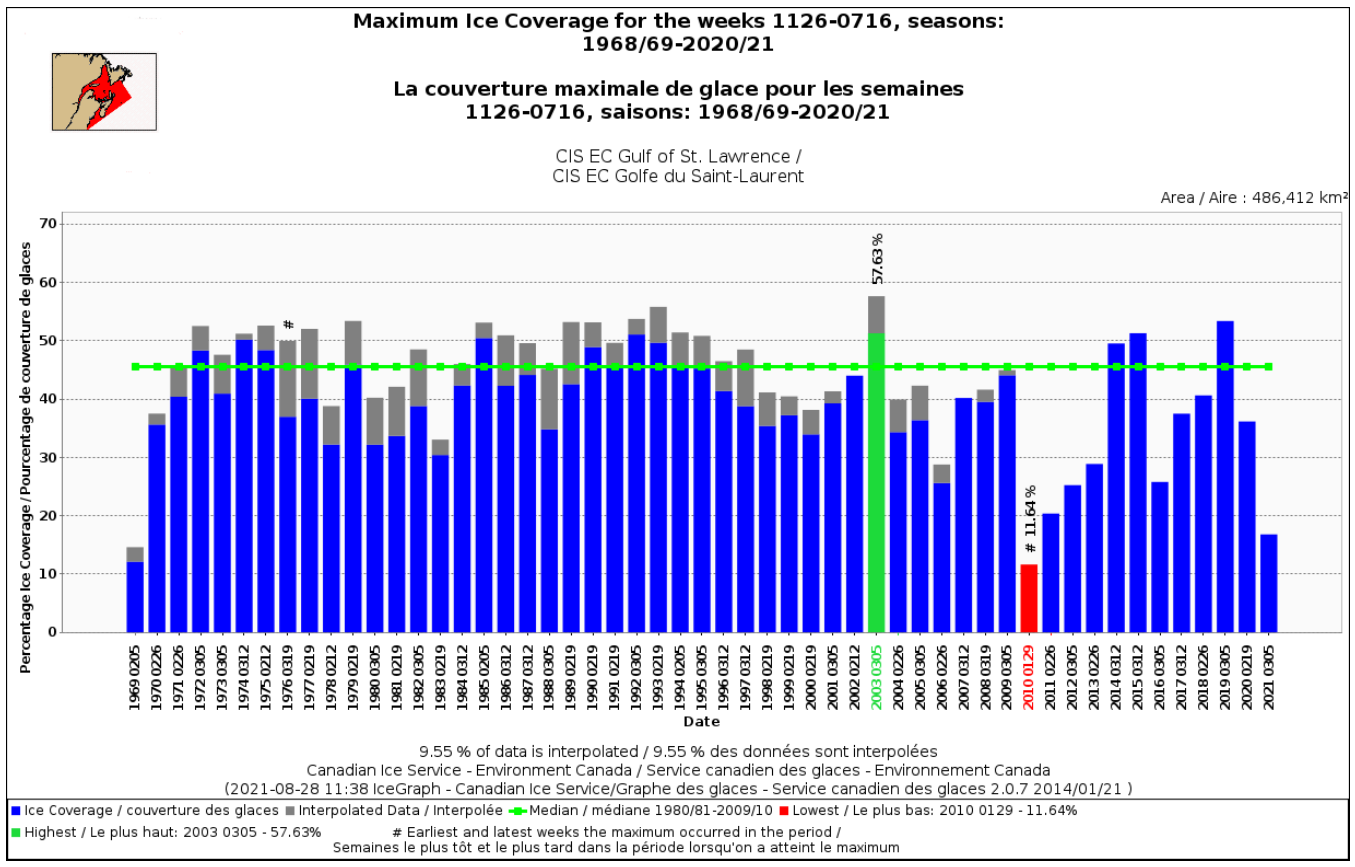


Figure 11: Maximum Ice Coverage in the Gulf of St. Lawrence by Season, 1968-2021

Newfoundland and Labrador Waters

2020-2021 Season temperature: November to June

Average air temperatures started out the 2020-2021 ice season near normal through early and mid-November, leading to the first new ice to form along the Labrador coast in mid-November.

In late-November, above normal average air temperatures covered the region and remained in place for much of the winter. From the end of November to mid-March, average air temperatures were 5-6 degrees Celsius above normal along the Labrador coast and 3-5 degrees Celsius above normal for most of the waters around Newfoundland. Within this stretch of above normal temperatures, during a three-week period from mid-January to early-February, average air temperatures peaked with anomalies of 10-14 degrees Celsius above normal along the Labrador coast and 4-8 degrees Celsius above normal for the waters around Newfoundland.

In mid-March, the Labrador coast experienced its first period of below average temperatures, with anomalies dropping to 2-4 degrees Celsius below the normal north of Groswater Bay. From Groswater Bay and south, average air temperatures were actually above average, the only spot in the East Coast, where temperatures were 1-2 degrees Celsius above average. This temperature regime lasted until the end of March.

Following the brief period of below average temperatures, a second sustained period of above average temperatures returned to the region with temperatures resting 2-3 degrees Celsius above normal across both the Labrador coast and the waters around Newfoundland for the month of April.

Average daily air temperatures moderated slightly in May, remaining near to slightly above normal through the month. June followed with slightly warmer temperatures for the waters around Newfoundland and up to Groswater Bay; temperatures were 2-3 degrees Celsius above normal. North of Groswater Bay, average air temperatures remained near normal. July continued with near to slightly above normal average air temperatures across the entire East Coast.

November Ice Conditions

The first ice of the season formed in mid-November as small concentrations of new ice formed in isolated bays along the Labrador coast and in Lake Melville, which is consistent with climatology. New ice continued to fill in the bays along the coast and expanded through Lake Melville in the second half of November. By the end of the month, Lake Melville was mostly full with new and grey ice, while small concentrations of new ice was spreading along the Labrador coast.

No ice formed in the waters around Newfoundland in November 2020.

December Ice Conditions

Ice conditions remained relatively unchanged through the first half of December with new ice struggling to take hold along the Labrador coast; forming and melting as temperatures rose and fell. New and grey ice ebbed and flowed in Lake Melville as well, with first grey-white fast ice forming near Happy Valley – Goose Bay. By the end of the second week, some ice had started to form in Sandwich Bay. Ice formation was still in line with climatology with ice coverage growing to 1.6%.

In the second half of December, new and grey ice finally started to form more substantially along the Labrador coast, at times extending 30-40 nautical miles out from the coast. Still being early in the season and the ice being thin, the ice along the coast was reduced to smaller concentrations when winds and warm temperatures associated with low-pressure systems affected the area around December 23rd and again on the 27th. Meanwhile, ice in the more sheltered Lake Melville area expanded to cover the entire lake and thicken in to grey and grey-white ice. The first traces of first-year ice on the lake appeared on the 25th in the fast ice lining the shore in the western extent of the lake. Very little ice formed south of Black Tickle through the month and remained relatively ice-free. By the end of the month, ice coverage had only grown to 2%, just below the long-term median of 5.2% and starting the season long below normal trend.

No significant ice formed in the waters around Newfoundland in December 2020. There were a few occasions where small areas of new ice formed in sheltered bays along the Northeast Coast around December 21st.

January Ice Conditions

January started with a rapid expansion of ice coverage, with significant new and grey ice growth along the coast and extending up to 60 nautical miles north of Black Tickle during a period of near normal temperatures. Fast ice began to take hold along the Labrador coast, covering most bays north of Groswater Bay and even thickening to first-year ice around Nain. Lake Melville was covered with grey-white ice, though very little of it was fast ice. This also marked the first week that large areas of ice formed south of Black Tickle. In this first week, ice coverage grew to 6.5%, still below the median of 8.2%, but the largest single week jump of the season.

The rapid growth did not last long and ice coverage was significantly reduced in the second week as a strong low-pressure system passed through the area on January 8th and 9th. Strong winds compacted the ice along the Labrador coast into grey-white ice while also destroying most of the ice south of Black Tickle. Despite the strong winds and warm temperatures, the ice continued to thicken in Lake Melville and by the end of the second week, the entire lake was grey-white or thin first-year fast ice. Due to the low-pressure system, ice coverage was reduced to 4%, nearly one third of the long-term median of 11.9%.

Following the strong low-pressure system, air temperatures dropped once again and new ice was permitted to quickly form and thicken, expanding out to 60-80 nautical miles from the coast. The ice became a mix of new, grey and grey-white ice with the thickest ice concentrated in the centre of the pack. The pack ice gradually expanded and contracted as minor weather systems moved through the area and thickened to be mainly grey-white ice by the beginning of the 4th week. During this time, the fast ice covering Lake Melville also thickened to thin first-year ice while minor concentrations of new and grey ice continued to form along the southern Labrador coast. During this period of growth, ice coverage rose to 7.9%, still lagging behind the climatological mean of 15.8%.

Ice coverage was sharply reduced starting on January 23rd as a strong low-pressure system affected the area until the 26th. Sea ice was once again compressed into a thin band of grey-white ice along the Labrador coast, while sea ice south of Black Tickle was nearly completely destroyed. Ice coverage was reduced to just 2.5%, falling well behind the long-term median of 19.9% for mid-January. Ice coverage was allowed to rebound only slightly by the end of the month as strong on-shore winds kept ice growth to a minimum. By the end of the month there was a 20-40 nautical mile wide band of ice along the Labrador coast made up of a mix of grey-white and thin first-year ice north of Groswater Bay with grey

and grey-white ice to the south. Coverage increased slightly to 4.5% however, it should be nearing the climatological median of 22-24%.

Once again, Newfoundland waters did not record much in the way of sea ice in the month of January. Occasional patches of new and grey ice moved through the Strait of Belle Isle and on a few cold evenings, some new ice formed in sheltered bays along the Northeast Coast. By the end of January, ice coverage still remained at 0% compared to the climate normal of 4.1%. The lack in sea ice can largely be attributed to the persistent above normal temperatures through the month.

February Ice Conditions

Ice coverage grew steadily in the first few days of February before contracting once again as another low-pressure system passed through the area. Thin first-year ice pushed as far south as Groswater Bay and the ice pack grew out to near 60 nautical miles from the coast north of Groswater Bay, but remained restrained to the coast south of that point until mid-February. The sea ice extent grew slightly from the week before; however, coverage remained well below the long-term average. In the second week, the ice coverage was 8.1%, just one third of the climatological mean of 24.3%, which also represents the median sea ice maximum for the South Labrador Sea.

Ice finally began to grow more significantly in the second half of February as near to slightly above normal temperatures returned to the region. Grey-white and thin first-year ice pushing out to 60-80 nautical miles from the coast north of Groswater Bay. The predominate ice type north of Black Tickle became thin first-year ice and the fast ice along the mid-Labrador extended out beyond the bay and inlets. By the end of the third week, thin first-year ice pushed to the southern end of the south Labrador coast. Ice coverage grew to 14.3%, nearly 10% lower than the long-term median of 24%.

February ended with continued sea ice growth as the ice edge expanded even further, varying from 80-120 nautical miles from the coast. Predominate thin first-year ice extended to the southern edge of the Labrador Sea forming a channel in the centre of the ice pack. Lower concentrations of grey and grey-white ice were found along the coast and similar concentrations of grey-white and thin first-year ice were located along the eastern edge of the ice pack. Ice coverage ended the month at 17.1%, resulting in the peak ice extent for the 2020-2021 ice season for the South Labrador Sea. This represented a delay in peak ice coverage of 2 weeks based on ice climatology. The 2020-2021 ice season recorded the second lowest maximum sea ice extent, behind only the 2010-2011 ice season.

The first half of February was calm once again in the Newfoundland waters, occasional patches of ice formed in Pistolet Bay and along parts of the Northeast Coast. It wasn't until the third week in February that measurable concentrations of ice were recorded. Ice coverage rose to 0.5%, well below the climatological normal of 10.5%. This initial rise coincided with a cold spell that affected the Labrador coast and to a lesser extent the Newfoundland waters, which allowed grey-white ice to enter Newfoundland waters for the first time this season. Some new and grey ice did manage to form along the Northern Peninsula and the Northeast Coast.

The cold spell lasted only a week and once the above normal temperatures returned, most of the new and grey that had formed in the previous week melted out, save for some ice that fasted along the Northeast Coast. Mobile sea ice continued to slowly flow from the Labrador Sea, which brought grey-white and first-year ice mid-way down the Northern Peninsula. Some new and grey ice did form towards the end of the month, once again, in a few isolated bays along the Northeast Coast and down into Bonavista Bay. The end of the month finished with 0.9% ice coverage, less than a tenth of the long-term median of 10.7%.

March Ice Conditions

March commenced with the passage of a low-pressure system through the Labrador Sea. This compressed the ice along the shore, reducing the extent of the first-year ice to within 60 nautical miles from the coast. For most of the month of March, ice coverage plateaued and hovered around 14-16% at a time when ice coverage typically steady around 21-22%. As sea ice continued to flow through the South Labrador Sea, the first concentrations of medium first-year ice arrived around Nain in the second week of March.

The third week in March was marked by the only sustained period of below normal temperatures. This brief cold spell permitted a second peak in ice coverage of 16.7% and the fast ice along the mid-Labrador coast thicken to medium first-year ice. Sea ice coverage expanded and contracted slightly as winds pushed ice off and on shore so that by the 4th week in March, medium first-year ice made it to Groswater Bay. The month ended with ice coverage being marked at 14.9%, maintaining the below median trend at 6% below the long-term median of 20.9%. The ice coverage trend through March was in-line with the climatological trend, albeit to a lesser extent and thickness than normal.

In Newfoundland waters, ice actually retreated in the first week of due to strong winds from a low-pressure system. The grey-white and first-year ice was pushed back to near Hare Bay and along its north coast, while the new and grey ice that formed in late February along the Northeast Coast also melted. Ice coverage fell to 0.4% by the end of the first week. Through the second week, sea ice once again pushed back into the northern Newfoundland waters and new ice formed around the northern tip of the Northern Peninsula, increasing ice coverage slightly to 1.5%.

More significant gains were made in the Newfoundland waters in the third week of the month. Strong winds pulled grey-white and first-year ice from the South Labrador Sea further south, within 60 nautical miles from the Northeast Coast, out to northeast of Bonavista. At the same time, new and grey ice formed along the eastern coast of the Northern Peninsula. Ice coverage jumped to 3.5%, which also marked the peak ice coverage for the Newfoundland waters for the 2020-2021 ice season. The peak also occurred during the same week as the climatological peak, though still far below the median of 11.1%. The jump in ice coverage was driven by the single sustained period of below average temperatures for the 2020-2021 ice season.

The end of March was marked by a decrease in ice coverage as daily average air temperatures continued to warm and daily high temperatures started to consistently rise above the freezing point. All of the new and grey ice had melted from the ice pack, leaving only grey-white and first-year ice and small areas of fast ice along the Northeast Coast. Ice coverage dropped slightly to 2.7%, commencing the typical spring melt at the end of March.

April Ice Conditions

The first week in April maintained a similar ice coverage as the end of March, as thin and medium first-year ice covered the coastal waters through the South Labrador Sea. Towards the end of the first week, a low-pressure system approached Newfoundland and Labrador and moved to lie over southwestern Labrador, commencing the first sustained period of above zero degrees Celsius daily high temperatures and strong winds. This led to a sharp reduction in sea ice coverage as ice concentrations thinned significantly from Groswater Bay and south, while further north, the ice pack was compressed against the shore. Ice coverage dropped to 9.6%, still well below the long-term median of 16%.

Ice conditions were not able to recover in the second half of April, as ice concentrations remained sparse from Groswater Bay and south. As temperatures continued to rise, by the end of the third week, ice conditions south of Black Tickle were reduced to be comprised of mainly bergy water with fast thin first-year ice in sheltered bays. To the north, ice coverage remained relatively unchanged as ice continued to flow in from the north, a trace of old ice also entered the region around this time. Ice concentrations reduced further in the last week of the month. Most of the fast ice along the south Labrador coast melted out and the mobile ice retreated to north of Groswater Bay. Lake Melville fractured on April 25th, nearly an entire month early compared to climatology. April ended with an ice coverage of 4.5% compared to a median of 13.1%, signalling the melt that was nearly a month and a half ahead of schedule for the South Labrador Sea.

The ice in the northern Newfoundland waters continued to retreat in the first week of April. Warm temperatures and southeasterly winds pushed the ice back to the northwest, leaving the ice pack mainly concentrated along the Northern Peninsula and to the east of Hare Bay. Continued easterly winds through the second week reinforced this trend, compacting the ice further along the Northern Peninsula and packing it into White Bay, while also pushing some ice into the Strait of Belle Isle. By the end of the second week, ice coverage had dropped to 0.4%, far below the climatological median of 6.2%.

The second half of April saw the end of the 2020-2021 ice season as the remaining mobile ice along the Northern Peninsula dispersed and melted and the final strips and patches melted by the last day of the month.

TAC for the East Newfoundland waters ended the 2020-2021 season at 0.34%, far below the climate median of 4.0%. This puts the ice season tied for the second lowest TAC, along with the 2010-2011 ice season, on record since the 1968-1969 season, with the lowest TAC occurring during the 2009-2010 season.

May Ice Conditions

The month of May started out with successive low-pressure systems that brought strong onshore winds to the Labrador coast. These winds significantly compacted the sea ice along the mid-Labrador coast, resulting in a band of fast and mobile medium first-year ice along the coast with medium first-year ice including a trace of old ice on the outer edge. With daily average air temperatures above the freezing point, this also meant new ice would no longer be forming.

The second week of May proceeded in a similar fashion to the first, with the mobile ice remaining compressed along the coast. By the end of the week, most of the mobile ice melted in Lake Melville and no ice remained south of Groswater Bay. Mid-May finished with an ice coverage of 3.4% compared to the climatological median of 11.3%. This put the spring melt near 4.5 weeks ahead of schedule, despite the advanced melt; the near normal average temperatures slowed the rapid pace of the ice melt up to this point.

Through the second half of the month, sea ice continued to retreat. Ice in Lake Melville completely melted by the 23rd of May, the trace of old ice spread through the rest of the pack ice and the break-up of fast ice along the mid-Labrador coast was well under way. By the end of May, Lake Melville was declared ice-free and the only mobile ice that remained was a thin patch along the mid-Labrador coast, mainly concentrated north of 55 degrees north. The month ended with an ice coverage of 1.6%, less than one quarter of the long-term median of 7.5%.

June Ice Conditions

Ice melt along the Labrador coast accelerated once again through early June. By the end of the first week, the rest of the fast ice along the mid-Labrador coast fractured and melted, leaving a small but concentrated area of medium first-year ice including a trace of old ice mainly between Hopedale and Groswater Bay. The rapid decline of the remaining sea ice continued in the second week, reducing sea ice to a sparse area around Cape Harrison. Ice coverage dropped to just 0.1% at the mid-point of June, where typically there would be a coverage of 4.5%. This small area of sea ice did not make it to the end of the 3rd week in June, finally melting out on June 20th, leaving the region as only bergy water and bringing a close to the 2020-2021 ice season in the South Labrador Sea.

TAC for the Southern Labrador Sea ended the 2020-2021 season at 5.82%. This puts the season as the 2nd lowest TAC recorded since the 1968-1969 season, only being beaten by the 2010-2021 ice season.

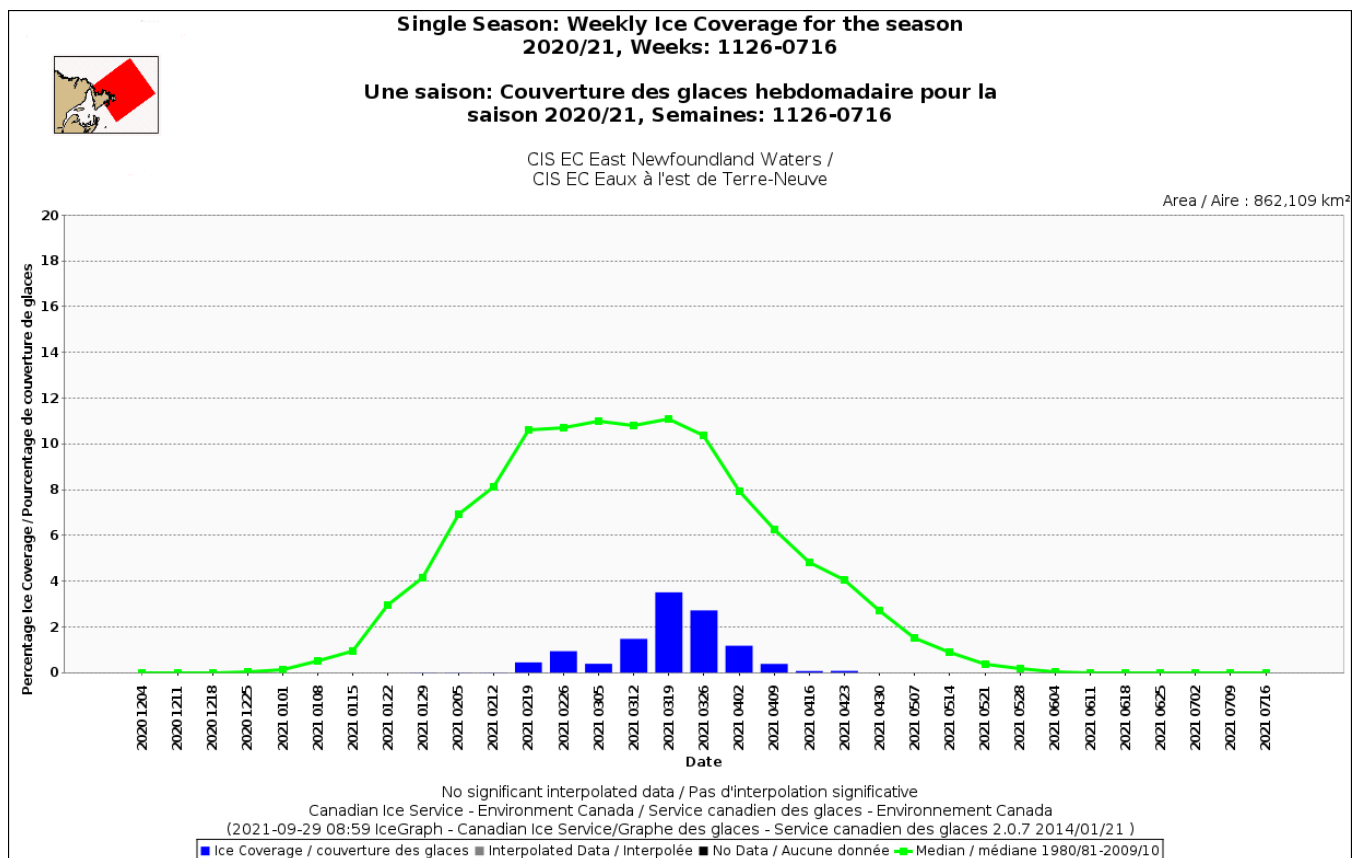


Figure 12: Weekly Ice Coverage for the 2020-2021 Season in Newfoundland

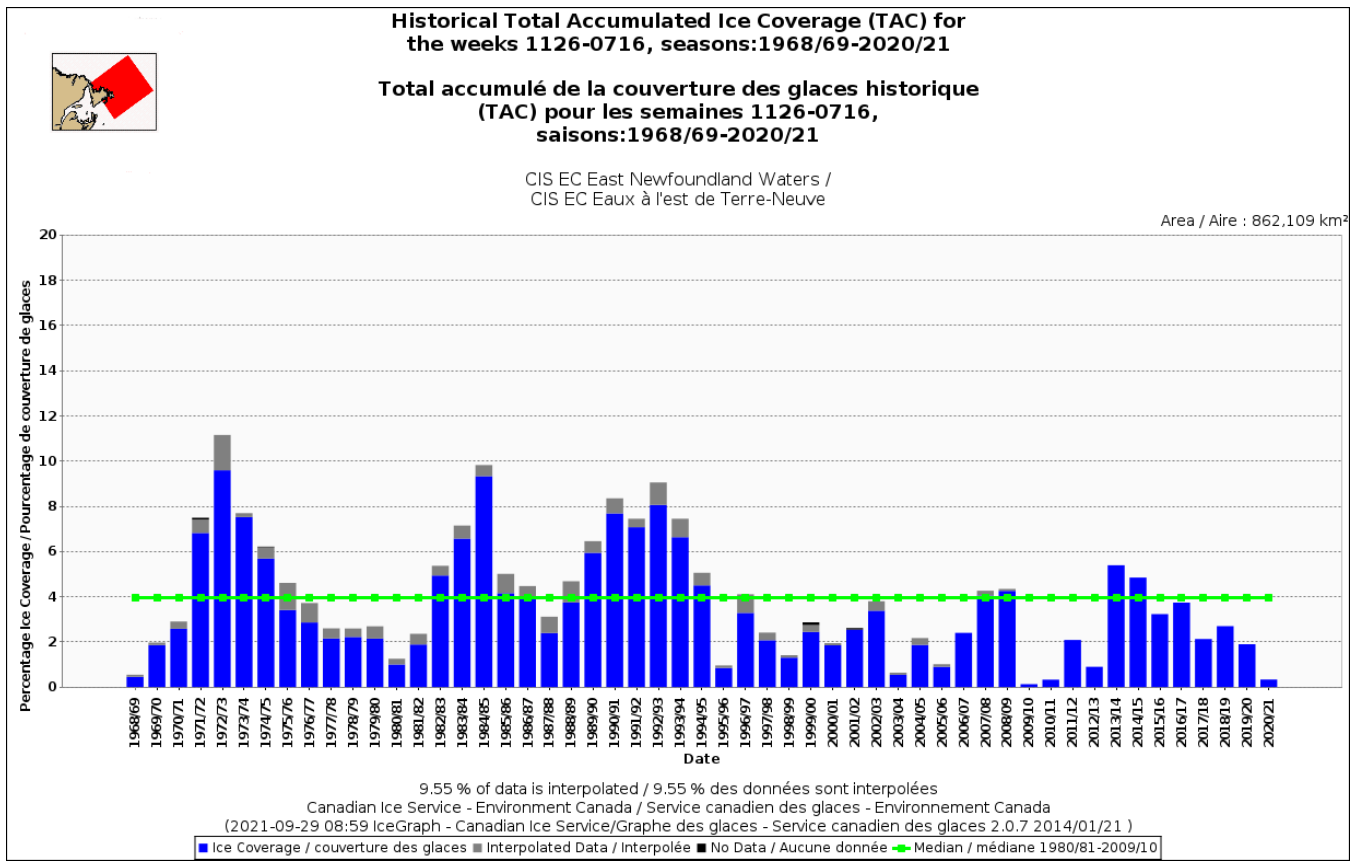


Figure 13: Historical Total Accumulated Ice Coverage Newfoundland Waters by Season, 1968-2021

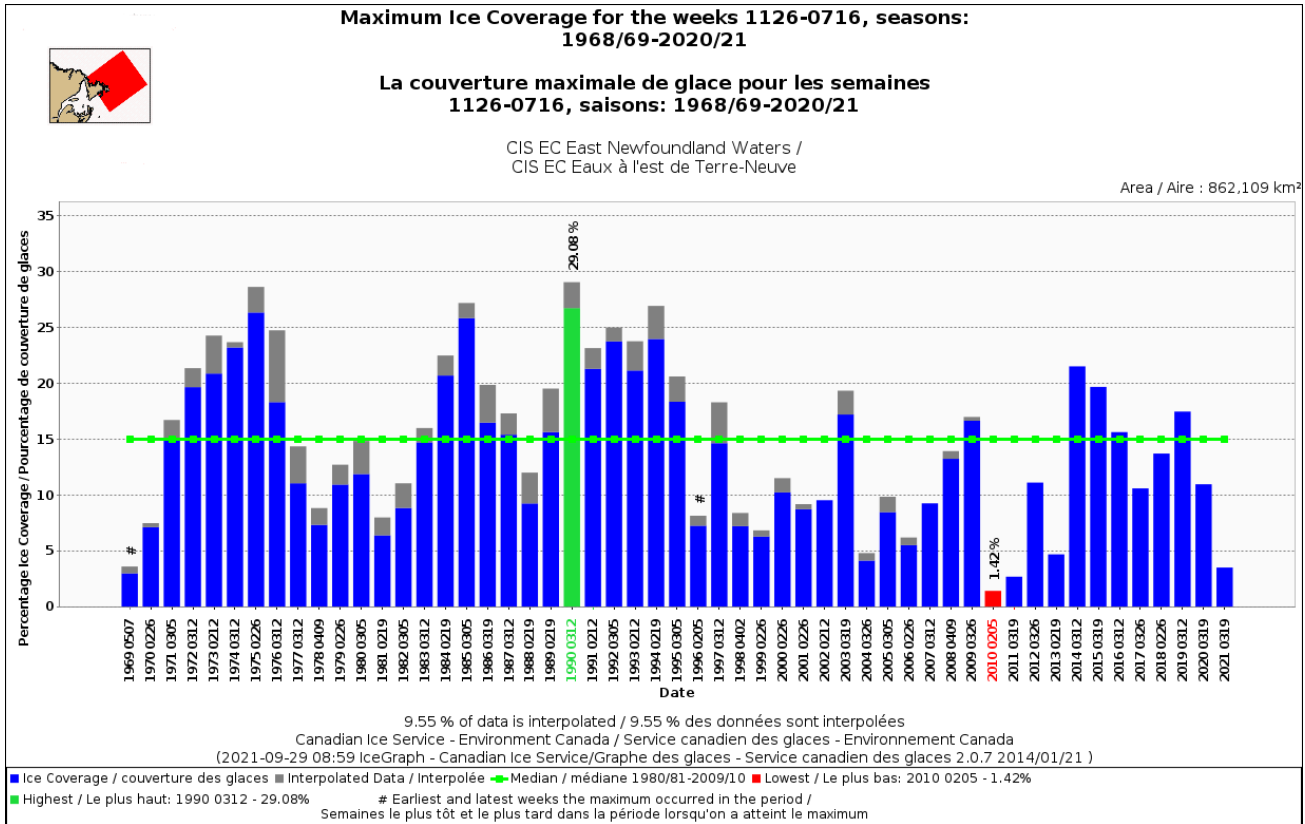


Figure 14: Maximum Ice Coverage in Newfoundland waters by Season, 1968-2021

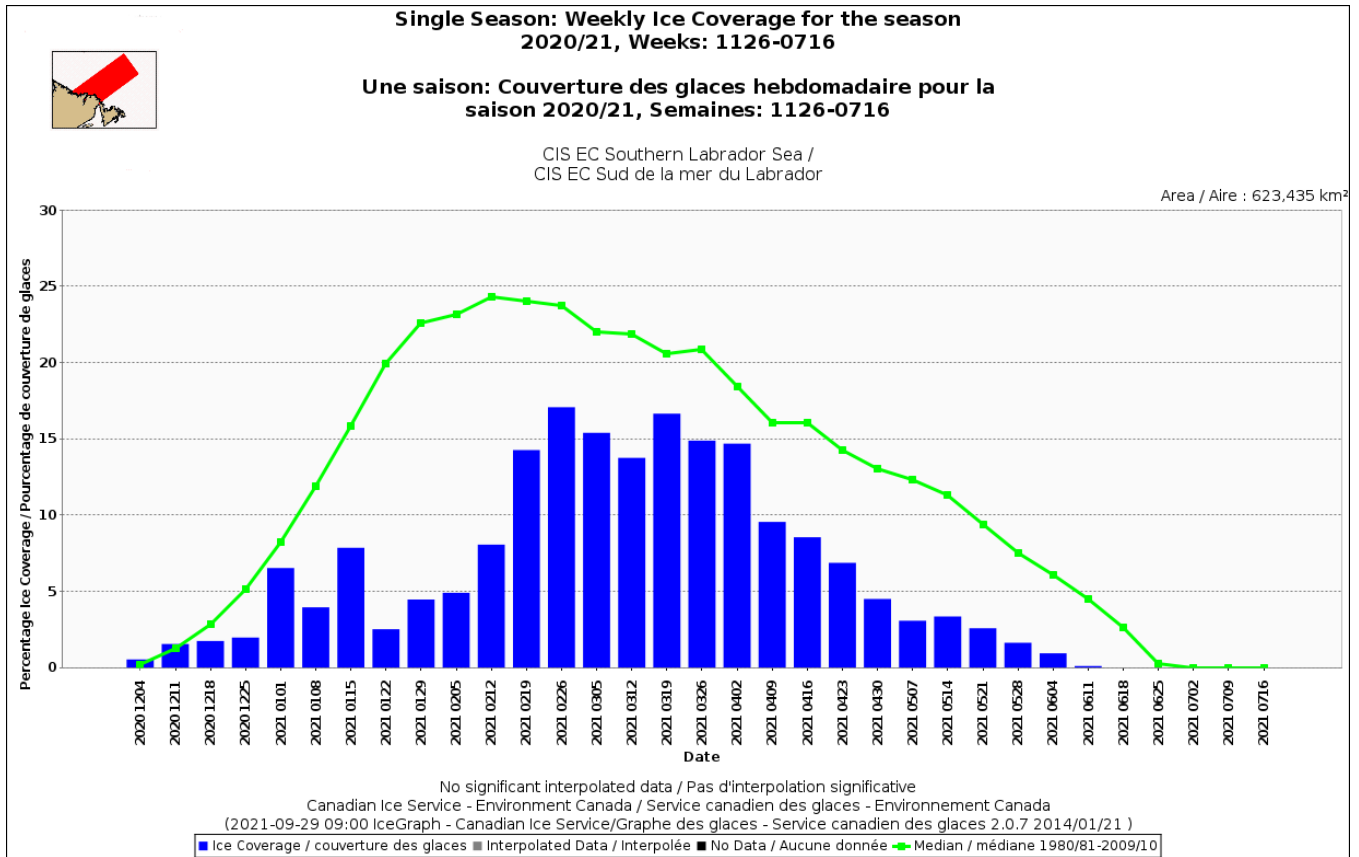


Figure 15: Weekly Ice Coverage for the 2020-2021 Season in the Southern Labrador Sea.

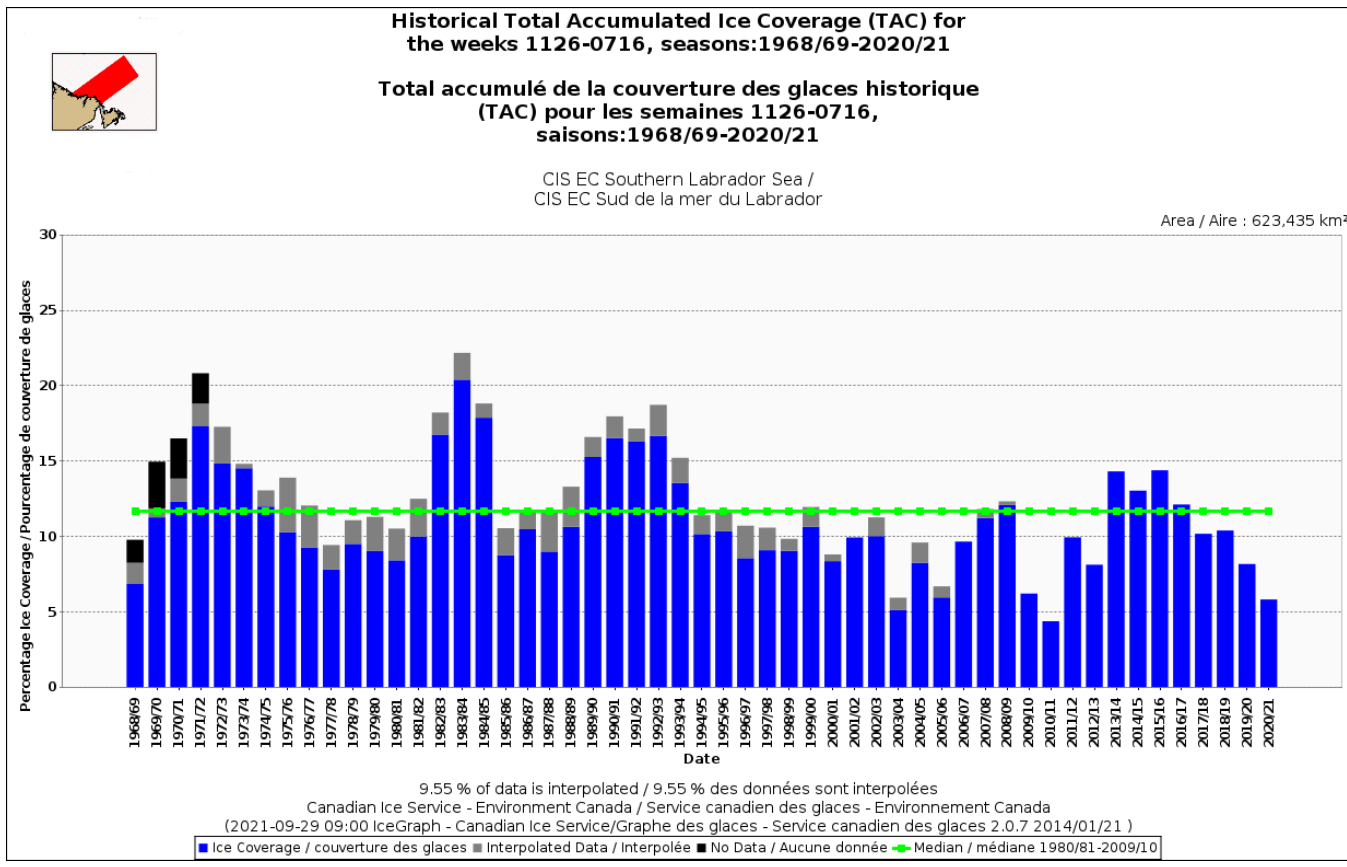


Figure 16: Historical Total Accumulated Ice Coverage for the Southern Labrador Sea by Season, 1968-2021

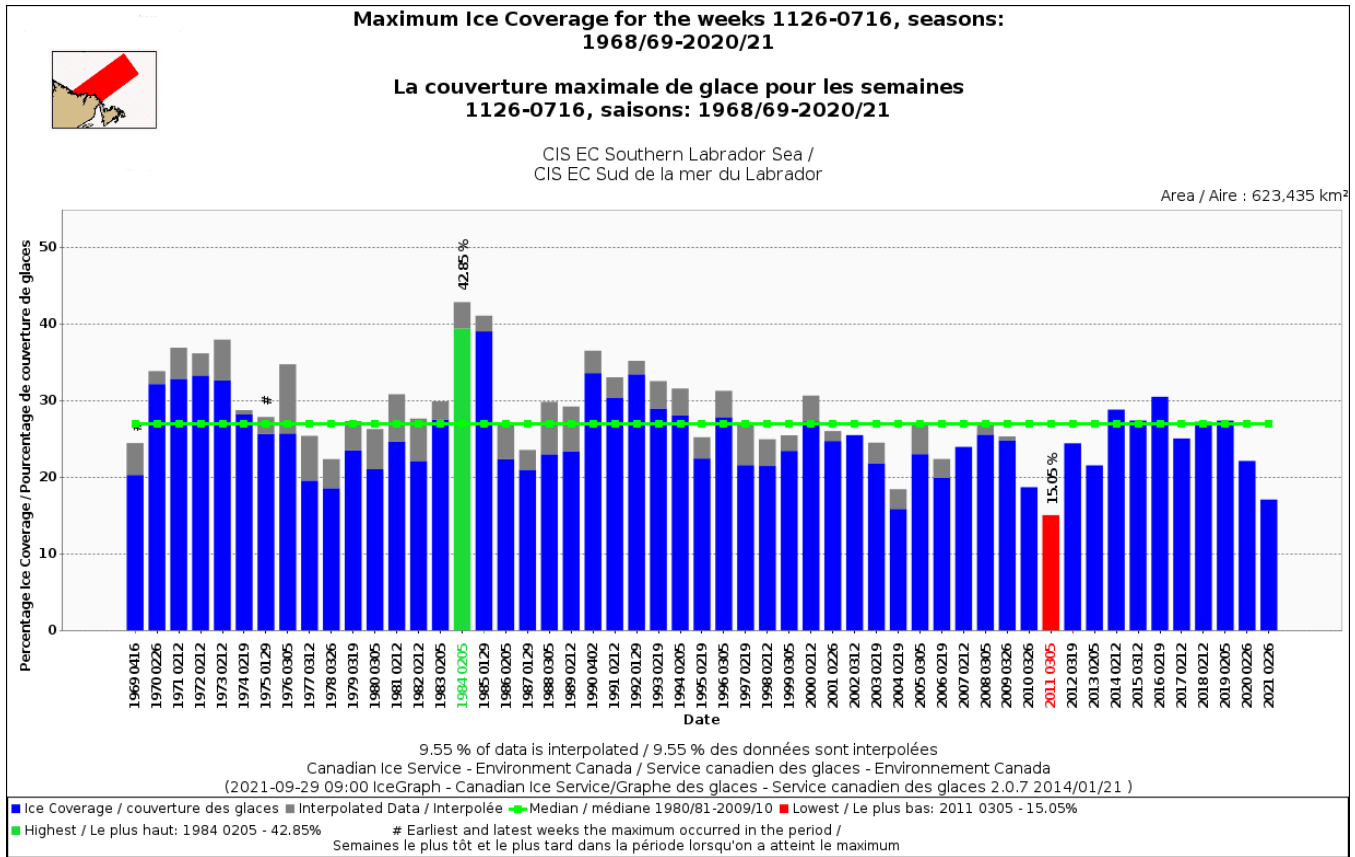


Figure 17: Maximum Ice Coverage in the Southern Labrador Sea by Season, 1968-2021

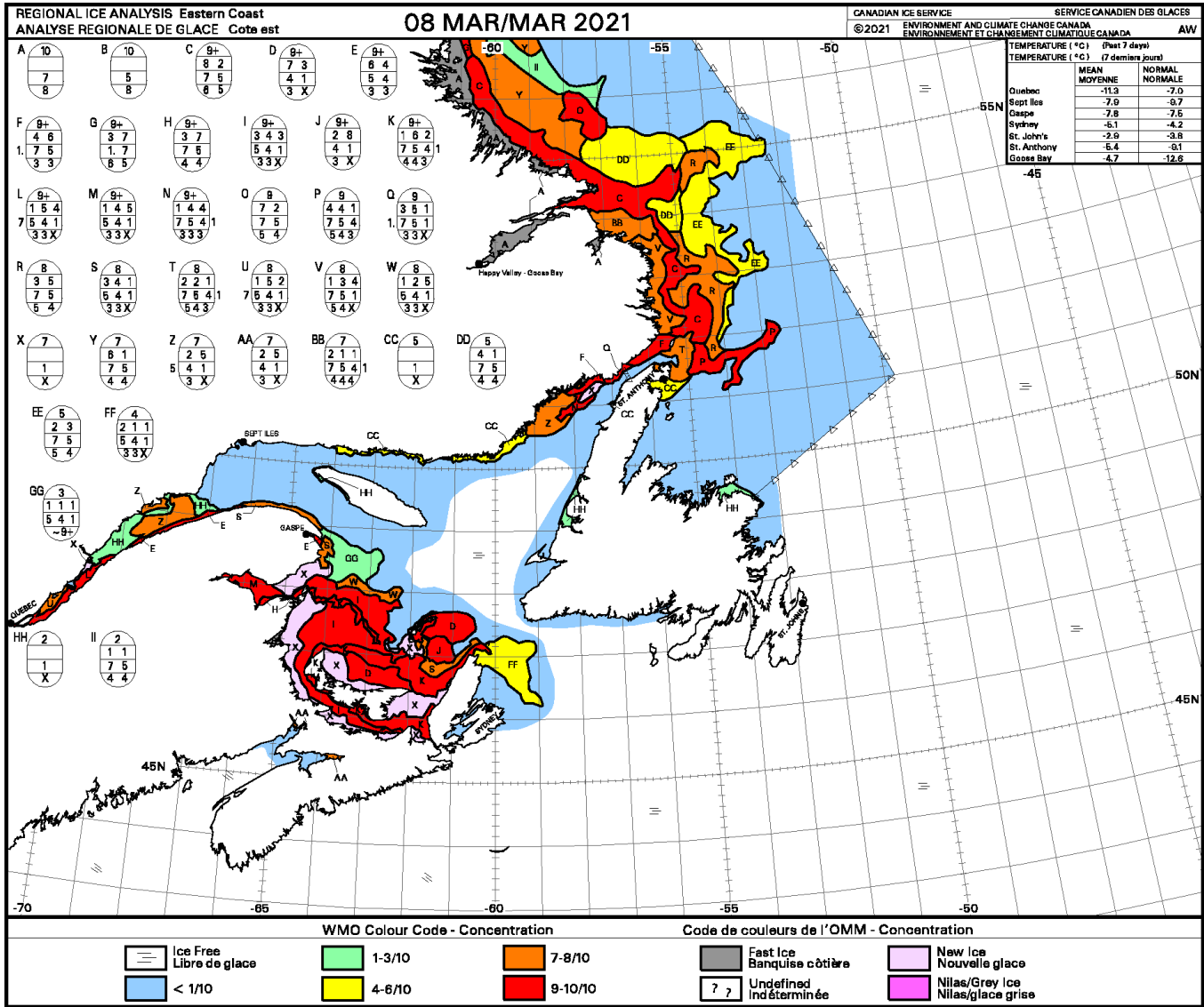


Figure 18: Maximum Ice Cover, Eastern Coast Regional Ice Chart – March 8, 2021.