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Lake Ice Climatic Atlas

Great Lakes
1981-2010

By

Canadian Ice Service
Le service canadien des glaces

Canada

Introduction

This Ice Atlas follows from other Canadian Ice Atlases published in 1980, 1990 and in 2000. The ice years 1980-81 through 2009-10 have been used for this publication and cover a climatological time period of 30 years, the standard for representing statistical averages and extremes.

Ice atlases have their greatest use for planning activities in ice infested waters. With this in mind, an attempt has been made to include in this atlas, an indication of the location of the ice throughout the ice season, its abundance, its thickness, and its variability.

In addition to what was contained in the previous atlas, we have added the 30 year Median of Ice Concentration When Ice Is Present.

Acknowledgements

Several people contributed to the production of this atlas and their effort and dedication should be acknowledged.

Dan Fequet: project management
Lionel Haché: analysis, climatology and editing
Steve McCourt: analysis, chart production and editing
Darlene Langlois: review, proof reading
Claude Dicaire: coordination of reference maps
Bruno Prémont and Amelia Jolicoeur: electronic media publication
Mike Brady, Cassandra Wiens (CO-OP): chart production

**Mr Haché updated the ice regime and climatology text, which was originally written by Mr Phillip W Cote.*

Finally thanks to all past and present personnel involved in the data acquisition and preparation of the weekly CIS and NIC charts over all these years without whom the production of this atlas would not have been possible.

To be cost effective and environmentally friendly, this information is only available in electronic format.

Table of Content

Data Used in Regional Charts

For this edition of the atlas, CIS data was used exclusively for the entire period. In the previous edition (1973-2002) charts from NIC were incorporated for the period 1996-2000. CIS remains grateful to GLERL for their contribution in digitizing the original ice charts for the period 1972/73 to 1994/95 and without their assistance, this atlas could not have been completed.

The production frequency of the Great Lakes Regional Ice Charts is weekly and prepared on Mondays. Since it is not done on the same date each year, a seven-day period centered on the Historical Dates has been selected for this climatological atlas. Ice charts are based on data within three days on either side of the date.

It should be noted that the original scale of the Regional Ice Chart was 1:4,000,000 and plotted on paper maps. Although the current analyses are prepared using a GIS computer application the amount of detail and accuracy is still comparable to the original maps.

Methodology

Since 1995, source data has automatically come from the Regional Ice Charts as they were produced. Before 1995, source data came from paper charts that were digitized. The Great lakes Regional Ice Chart collection encompasses nearly 40 years of ice information spanning from 1972/73 to the present.

The dates of analysis vary through time as do the first and last charts of any given season. Ideally, the Regional Ice Charts for southern areas (i.e. the Eastern Coast and the Great Lakes) should begin when ice first appears in the area. This was not always the case, and as such, an experienced ice forecaster reviewed the start and end of the season to ensure that any instances of first or last ice were included. In such cases, analogue charts representing the appropriate pattern of ice formation were used to ensure a complete set of charts for each historical date. Occasional missing charts were handled in a similar manner.

In the previous atlas, it was noticed after-the-fact that certain areas may not have captured realistic freeze-up or break-up conditions. In particular, Black Bay and Nipigon Bay (Lake Superior) and Big Bay de Noc and Little Bay de Noc (Green Bay, Lake Michigan) were problematic. Although an analogue approach was used for the previous atlas, the technique was further refined in this publication and provided a more systematic and robust methodology for dealing with such instances. Additionally, certain areas have been masked out for data processing due to inconsistent analysis or changes to the underlying coastline.

Minor corrections after-the-fact still took place in order to maintain consistency between historical dates and also between products.

Areas of fast ice in this atlas now contain a stage of development. This information has been added at the time of the chart production since 2003; however, for charts before that time, a senior forecaster provided stages of development for areas of fast ice based primarily on Freezing Degree Days (FDDs), amongst other meteorological parameters for the period.

The data itself is analyzed using GIS software and well-established customized scripts to produce the various statistical outputs. Once the original vector data is assigned a historical date, it is then converted to a raster data format at 1 km resolution. Various algorithms then perform operations to statistically summarize the individual ice charts and output the climatological products seen in the atlas.

In preparing an ice atlas, medians rather than averages are used. If one considers a single data point near the edge of the fast ice in late spring, the ice conditions can be ten tenths when fast ice is present or open water after the ice breaks up. Rarely will the four to six tenth range of ice concentration occur, which is the inevitable result if one averages between no ice and ten tenths. A median on the other hand will be either zero or ten tenths depending on the relative frequency of break-up before or after the given date. This is more appropriate for an atlas describing ice conditions. With a thirty-year time period, an even number of values are used for each particular grid point and the higher of the two middle values is chosen as the median, a policy that has been adopted since the production of the Hudson Bay and Approaches atlas in the early 1980s.

Definition of Lake Ice Climatic Charts

Statistics Described

The ice charts contained within this atlas are derived climatological products representing a 30-year "normal" of various ice parameters. Two key statistical terms have been used to derive and describe the charts: median and frequency. The "median" is a statistical technique used to examine a dataset and is calculated by ordering all the values of the dataset from smallest to largest and selecting the middle value of an odd-numbered dataset or the average of the two middle values in an even-numbered dataset. For this atlas, the middle value of the even-numbered dataset was considered to be the upper observation, thus avoiding the averaging situation for an even-numbered dataset. The median is employed with ice statistics due to the ordinal nature of the ice attributes. For example, 9+/10 ice concentration is greater than 9/10 concentration and thick lake ice is greater (thicker) than medium lake ice.

The median is more appropriate than the average or mean when considering ice attributes. The example cited in the Methodology section of a fast ice edge where during the break-up season, concentration values at a single point over a number of years are either 10/10 or less than 1/10 may be used to illustrate why the median is more appropriate. Consider the following dataset of 5 observations of ice concentration in tenths: (10, 10, 10, 0, 0). The average value would be (10 + 10 + 10 + 0 + 0)/5 = 6/10 which would not be a "real" ice situation.

The "frequency" is another statistical technique used to examine a dataset and is calculated by summing the number of observations of an occurrence or event (e.g. the presence of lake ice) and dividing by the total number of observations for the dataset and expressed as a percent of the total number of observations.

Dates of Freeze-up and Break-up

The "Dates of Freeze-up and Break-up" depicts the extent of ice on a bi-weekly basis during the freeze-up and break-up seasons. They provide a pictorial representation of the evolution of ice during those periods.

These products are constructed using the Median of Ice Concentration charts.

Median of Ice Concentration

The "Median of Ice Concentration" charts consider total concentration of ice on a weekly period from November 5 to June 4. The charts do not represent any real ice season but rather a statistical composite for the period.

The charts represent the statistical "normal" ice concentration for the appropriate date.

Median of Ice Concentration When Ice is Present

The “Median of Ice Concentration When Ice is Present” charts consider total concentration of ice on a weekly period from November 5 to June 4.

The charts are a new addition to the atlas and are meant to assist in interpreting the complementary “Median of Predominant Ice Type When Ice Is Present” charts. The most appropriate way to interpret the charts is to view the median of ice concentration when ice is present in conjunction with the frequency of presence of lake ice charts. For example, at a particular point, the frequency of presence of lake ice might be in the range of 34-50% and the median of ice concentration when ice is present might be 9/10 to 9+/10. Thus, at this location, there is a 34-50% chance of encountering lake ice, and when ice is present, it is

“normally” 9/10 to 9+/10 concentration. Additional insights may be provided by examining the Predominant Ice Type When Ice Is Present charts.

The charts represent the statistical “normal” ice concentration when ice is present for the appropriate date.

Median of Predominant Ice Type When Ice Is Present

The "Median of Predominant Ice Type When Ice Is Present" charts consider the predominant ice type (ice type of the greatest concentration) on a weekly period from November 5 to June 4.

The most appropriate way to interpret the charts is to view the median of predominant ice type in conjunction with the frequency of presence of lake ice charts. For example, at a particular point, the frequency of presence of lake ice might be in the range of 34-50% and the median of predominant ice type when ice is present might be medium lake ice. Thus, at the point, there is a 34-50% chance of encountering lake ice, and when ice is present, it is “normally” medium lake ice. Additional insights may be provided by examining the ice concentration when ice is present charts.

The charts represent the statistical "normal" predominant ice type when ice is present for the appropriate date.

Frequency of Presence of Lake Ice (%)

The "Frequency of Presence of Lake Ice (%)" charts consider the likelihood of total concentration of ice greater than or equal to 1/10 on a weekly basis period from November 5 to June 4 and are anticipated to give the reader an idea of the likelihood that ice will occur at a particular location for the appropriate date.

The charts can be interpreted as the "probability of encountering lake ice for the period" The charts depict above normal extent (1 to 33%), near normal extent (34 to 66%) and below normal extent (67 to 99%). The 0% line represents the maximum extent of ice, beyond it no ice was reported in the 30-years; the 100% line represents the minimum extent of ice, within it there has always been ice reported in the period.

Meteorological Influences

Weather has a direct bearing on the planning and execution of winter navigation. Temperatures control the extent and thickness of ice that forms, and the surface winds modify its location, form and distribution. During winter, cold air from the Canadian Arctic can be carried southeastward across Canada, resulting in temperatures far below the freezing point, causing superstructure icing and

rapidly increasing the volume and extent of the lake ice present. On the other hand, migratory low pressure centres may result in warm air from lower latitudes sweeping northward and creating melting conditions that last anywhere from a few hours to several weeks. The winter seasons vary considerably in severity depending upon the relative frequency and the paths of these migratory storm centres.

In considering ice formation, ice growth and ice deterioration, the amount of heat exchange between ice, water and air is of basic importance. However, due to the complexity of these processes and their measurement, air temperature is often used to quantify the effect of freezing and melting conditions. More specifically, when the mean air temperature for a day is below 0°C, the numerical value can be expressed as the number of Freezing Degree-Days (FDD) and, when above 0° Celsius, expressed as Melting Degree-Days (MDD).

Wind direction and strength during the winter have considerable effect on the ice cover for its thickness, location, and the degree of obstruction to navigation.

Oceanographic Factors

The main oceanographic factors influencing the ice regime are bathymetry, currents, and tides. There is a brief description of bathymetry and currents for each lake. Tidal ranges are generally very small.

Bathymetry and Current

Lake Superior

This is the largest of the Great Lakes and is the deepest with the maximum depth of 406 metres in the southeast part of the lake. The Keweena Peninsula and Isle Royale are prominent features in Lake Superior. The Superior Shoal with a minimum water depth of 6.4 metres lies in the middle part of the lake about 85 kilometres east of Isle Royale.

The waters of Lake Superior flow outward through the St. Marys River into Lake Huron and for the most part currents in the lake are weak. Wind-generated currents are known to produce upwelling of lake water.

Lake Michigan

This is the third largest of the Great Lakes and the second deepest with a maximum depth of 281 metres in the central part of the lake. The area to the north of Beaver Island and the Straits of Mackinac are shallow and less than 37 metres deep.

Water currents are generally weak in the lake but there exists a circular pattern in southern Lake Michigan that is unique.

Lake Huron

Lake Huron is the second largest of the Great Lakes and the fourth deepest with a maximum depth of 229 metres just 27 kilometres west of the Bruce Peninsula. Generally speaking it is deep but northern and eastern shores have shoals extending 5 kilometres offshore in places. The most striking feature of the bottom of the lake is a submerged ridge which extends from Alpena, Michigan across the lake to Kincardine, Ontario. Six Fathom Bank, with a depth of 11 metres, lies on this ridge in mid-lake.

The north and east shores of Georgian Bay are bordered by many islands and shoals while the southwest portion is generally deep. A maximum depth of 168 metres lies just off the north shore of the Bruce Peninsula.

Lake Huron receives the waters of Lake Michigan through the Straits of Mackinac and those of Lake Superior by way of the St. Mary's River, and in turn discharges into the St. Clair River. Water currents are generally weak in the lake and the bay.

Lake Erie

This is the most southerly of the Great Lakes and is also the shallowest of them. Its maximum depth of 64 metres lies just southeast of Long Point. West of Point Pelee the lake is very shallow with water depths less than 11 metres. Water depths in Lake St. Clair are less than 6 metres.

The flow of water in the lake is generally from the Detroit River at the west end in a northeasterly direction to the main outflow through the Niagara River. Water currents in the lake are generally weak.

Lake Ontario

Lake Ontario is the smallest of the Great Lakes but is the third deepest with a maximum depth of 244 metres located in the southeastern part of the lake. The northeastern end of the lake (the approaches to the St. Lawrence River) is the shallowest area where water depths are less than 55 metres.

The flow of water in Lake Ontario is mainly from the Niagara River northeastward to the St. Lawrence River. Water currents in the lake are generally weak.

The Ice Regime

Lake Superior

Ice Regime

Initial ice formation begins in harbours and bays along the north shore, in the western portion of the lake, and over the shallow waters of Whitefish Bay normally near the end of November to early December. The amount and thickness of ice increases so that the entire perimeter of the lake becomes covered and then extends many kilometres out into the lake by mid-winter. At the peak of the season at the last half of February, ice typically covers 75% of the lake. The eastern portion of the lake between Stannard Rock and Caribou Island will usually remain open water throughout the winter.

Break-up normally begins in March and the ice is in a state of deterioration by the end of the month. Most of the lake is open water by mid April; however, winds and water currents can cause the ice to drift into the southeastern end of the lake.

Variations

Ice conditions can vary greatly from year to year. In a mild winter, the maximum ice coverage in Lake Superior may attain only about 12% (1997-98) while during a severe winter coverage may reach 100%. Ice has formed as early as the first week of November and persisted as late as the last week in May.

Ice Thickness

In sheltered harbours and bays, ice tends to grow to 45 to 85 cm during a normal winter. Rafting can create ice thicknesses up to a metre or so. Windrows of grounded ice in Whitefish Bay can pile up to 7-8 metres or more above sea level. Offshore ridges of ice can result in total ice thicknesses reaching 25 metres.

Lake Michigan

Ice Regime

Lake Michigan's north-south orientation and length mean that it can have ice formation and deterioration occurring simultaneously. Initial ice formation begins in Green Bay normally during the first half of December. The next areas to become ice covered are the Straits of Mackinac and the shallow areas north of Beaver Island. In these areas ice starts to develop in the first week of January. The ice forms and accumulates in a southerly direction with a rapid build-up along the Fox Islands and a slower growth rate around the southern perimeter.

Maximum ice cover occurs about the middle of February with usual maximum coverage around 25%. The central portion of the lake south of 45º North latitude usually remains open water throughout the winter.

Break-up normally begins the second half of February and progresses from south to north. Most of the lake is open water by the first half of April. The strait and island areas of Mackinac usually produce formidable ice ridges which linger into late in the season.

Variations

Ice conditions can vary greatly from year to year. In a mild winter, maximum ice coverage in Lake Michigan may be only 12% while during a severe winter it may increase to near 85%. Ice has formed as early as the last week of November and persisted as late as the second week of May.

Ice Thickness

In sheltered harbours and bays, ice typically grows to 45 to 75 cm over winter. Rafting can create ice thicknesses up to a metre or more. Areas of ridges of ice in the Straits of Mackinac can reach up to 9 metres above sea level with depth up to 2 or 3 times greater.

Lake Huron

Ice Regime (Lake Huron and Georgian Bay)

The orientation and patterns of ice formation of Lake Huron are similar to those of Lake Michigan; however, temperature differences between north and south are not as great. Initial ice formation begins in North Channel and along the east coast of Georgian Bay during the second half of December. As the winter progresses, ice expands around the coastal areas and then extends out into the lake. Maximum ice cover occurs around the middle of February with about 50% coverage in Lake Huron and 90% coverage in Georgian Bay. The deep central and north portion of Lake Huron usually remain open water throughout the winter.

Break-up normally begins in March with the entire lake clearing by the second week of April. Large volumes of ice can drift into the southern portion of Lake Huron resulting in a heavy concentration of ice at the entrance to the St. Clair River.

Variation (Lake Huron and Georgian Bay)

Ice conditions can vary greatly from year to year. In a mild winter, the maximum ice coverage on Lake Huron and Georgian Bay may be as low as 26% (winter 2001-02) while during a severe winter, the coverage on Lake Huron and Georgian Bay can be more than 95%. Ice has formed as early as the last week of November and has persisted as late as the third week of May.

Ice Thickness (Lake Huron and Georgian Bay)

In sheltered harbours and bays, lake ice typically grows to 45 to 75 cm during a normal winter. Areas of ridging can contain ice thicknesses of up to 18 metres.

Lake Erie

Ice Regime (Lake Erie and Lake St. Clair)

Ice formation begins in the western end of the lake and in Long Point Bay normally during the second week of December. Elsewhere the amount of ice cover begins to accelerate in early January and is usually at its maximum extent (70%) in February. Lake St. Clair is normally completely ice covered or consolidated from the middle of January until March.

Break-up for Lake Erie normally begins near the end of February with the lake becoming mostly open water by the first week of April. The eastern end of the lake is usually the last area to clear.

Variations (Lake Erie and Lake St. Clair)

In a mild year, the maximum extent of the ice cover could be as little as 8% of the lake's surface. During severe winters, 100% coverage can occur. Ice has formed as early as the first week of December and has persisted in the Buffalo area as late as the middle of May.

Ice Thickness (Lake Erie and Lake St. Clair)

In sheltered bays, ice typically grows to 25 to 45 cm over winter. Rafting and ridging of ice can create aggregate ice thicknesses in excess of 20 metres during a single winter storm.

Lake Ontario

Ice Regime

Ice formation begins in the Bay of Quinte normally during the third week of December. Ice begins to form in the bays at the eastern end of the lake and in the approaches to the St. Lawrence River during the first week of January. An extensive ice cover does not appear until the last week of January and is usually confined to the eastern end of the lake. Maximum ice cover which usually occurs during the first half of February totals about 17%.

Break-up normally starts late in February with the lake becoming generally open water in late March. Ice may be found below Niagara Falls, in protected bays and in the approach to the St. Lawrence River somewhat later.

Variation

In a mild winter, ice coverage on Lake Ontario is only about 10% while in a severe winter it can increase to 65%. Lake Ontario will rarely reach complete ice cover; one year this happened was in 1979. . Ice has formed as early as the third week of November and has persisted as late as the last week of April.

Ice Thickness

In the sheltered bays, ice typically grows to 20 to 60 cm over winter. Ridging, rafting and hummocking can significantly increase these thicknesses.

Variability of Total Ice Coverage

In this atlas, there is a new parameter that depicts an entire ice season as a single value known as “Total Accumulated Coverage (TAC)”.This parameter permits comparisons of one season to another.

In order to calculate the TAC, each polygon area is multiplied by the associated total ice concentration, summed up for the entire chart, and then normalized by the total area to arrive at a single value for each chart. This value is then summed for the entire season and finally normalized by the number of weeks in a season to arrive at the single value for the season.

The most ice encountered in a single season in the Great Lakes for the period occurred in 1993/94 and represents (on average) approximately 28% ice coverage throughout the entire season; the least amount of ice occurred in 1997/98 and represents approximately 3% ice coverage; and the median amount

of ice is approximately 13% ice coverage. From 1981 to 2010 there was no statistically significant trend in the amount of ice coverage.

The most ice encountered in a single season in Lake Ontario for the period occurred in 1981/82 and represents (on average) approximately 12% ice coverage throughout the entire season; the least amount of ice occurred in 2001/02 and represents near 0% ice coverage; and the median amount of ice was approximately 4% ice coverage.

The most ice encountered in a single season in Lake Erie for the period occurred in 1981/82 and represents (on average) approximately 39% ice coverage throughout the entire season; the least amount of ice occurred in 1997/98 and represents near 0% ice coverage; and the median amount of ice was approximately 21% ice coverage.

The most ice encountered in a single season in Lake Huron for the period occurred in 1993/94 and represents (on average) approximately 35% ice coverage throughout the entire season; the least amount of ice occurred in 1997/98 and represents approximately 7% ice coverage; and the median amount of ice was approximately 18% ice coverage.

The most ice encountered in a single season in Lake Michigan for the period occurred in 1993/94 and represents (on average) approximately 17% ice coverage throughout the entire season; the least amount of ice occurred in 1997/98 and represents approximately 3% ice coverage; and the median amount of ice was approximately 8% ice coverage.

The most ice encountered in a single season in Lake Superior for the period occurred in 1995/96 and represents (on average) approximately 33% ice coverage throughout the entire season; the least amount of ice occurred in 1997/98 and represents approximately 2% ice coverage; and the median amount of ice was approximately 14% ice coverage.

Examples of minimum and maximum ice conditions for the entire Great Lakes region are provided to illustrate the spatial extent of such ice conditions

Charts

30-Year Median of Ice Concentration Charts

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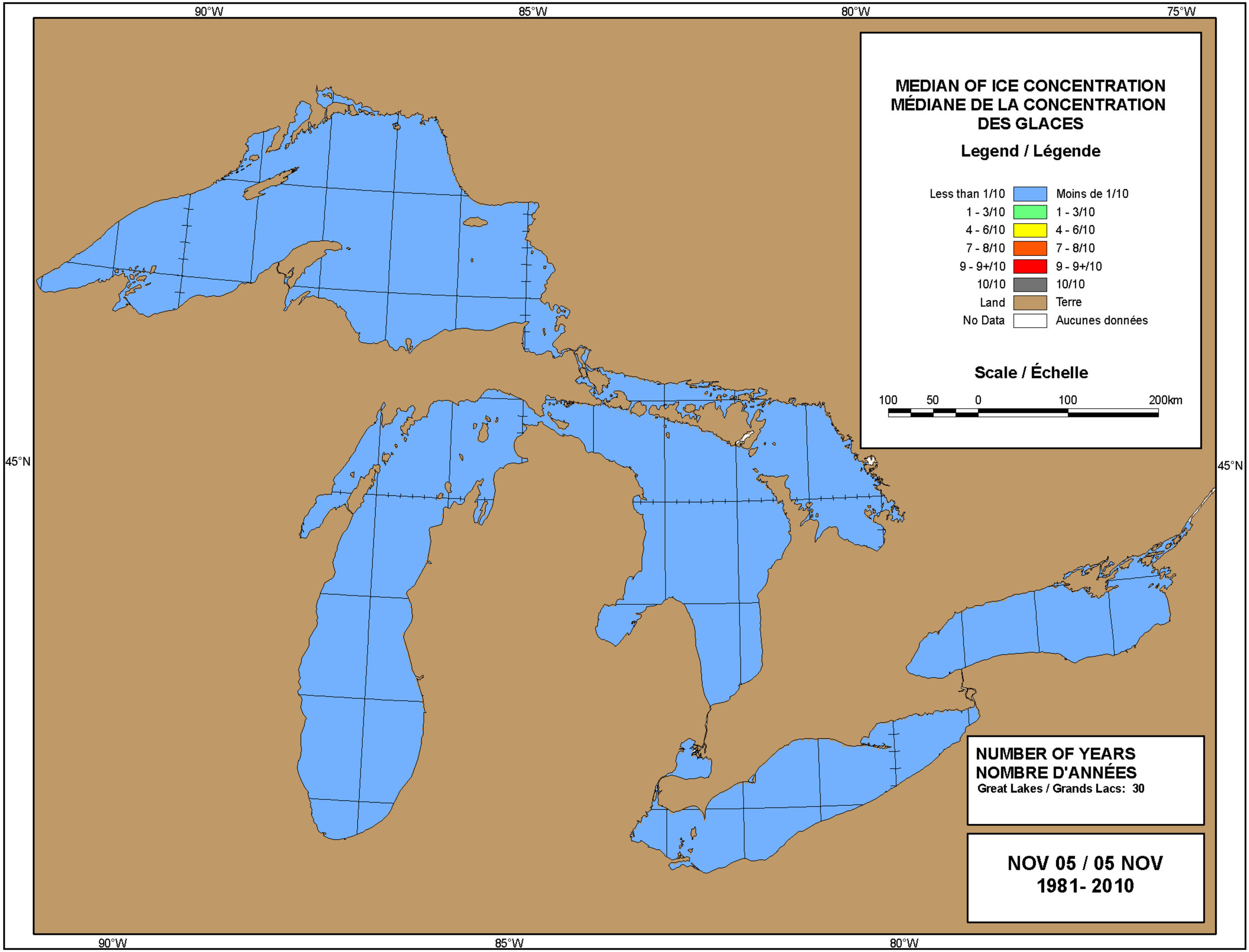

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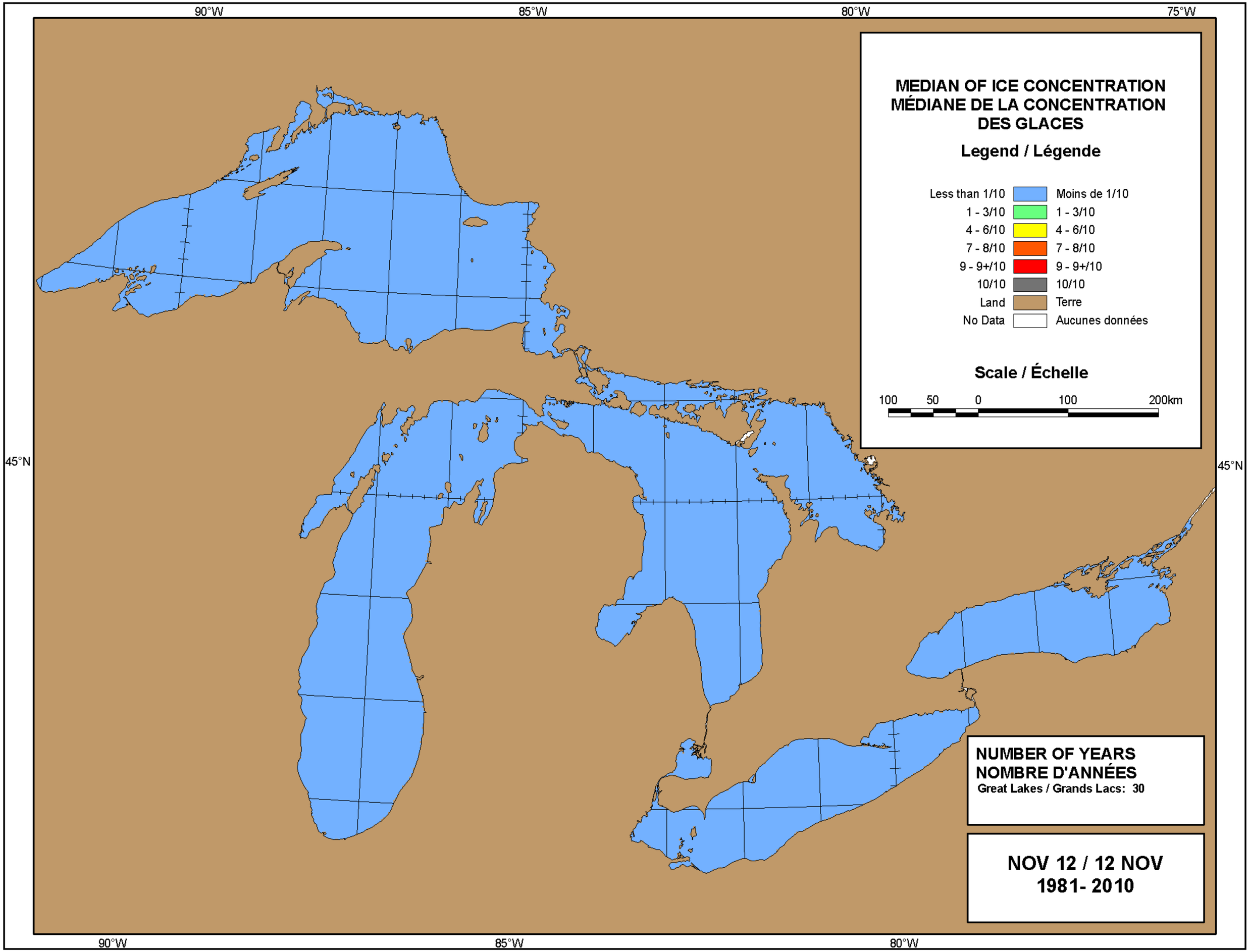

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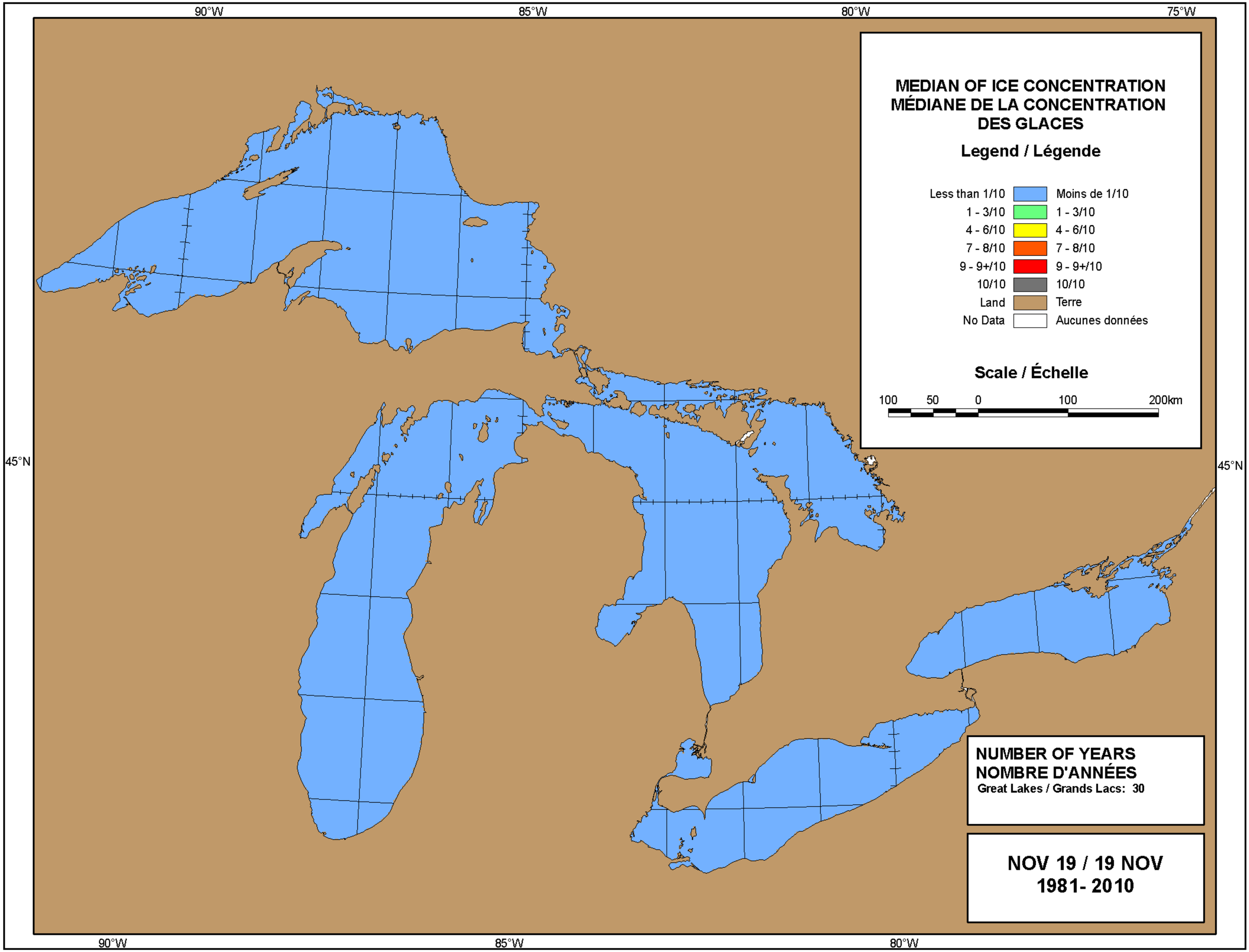

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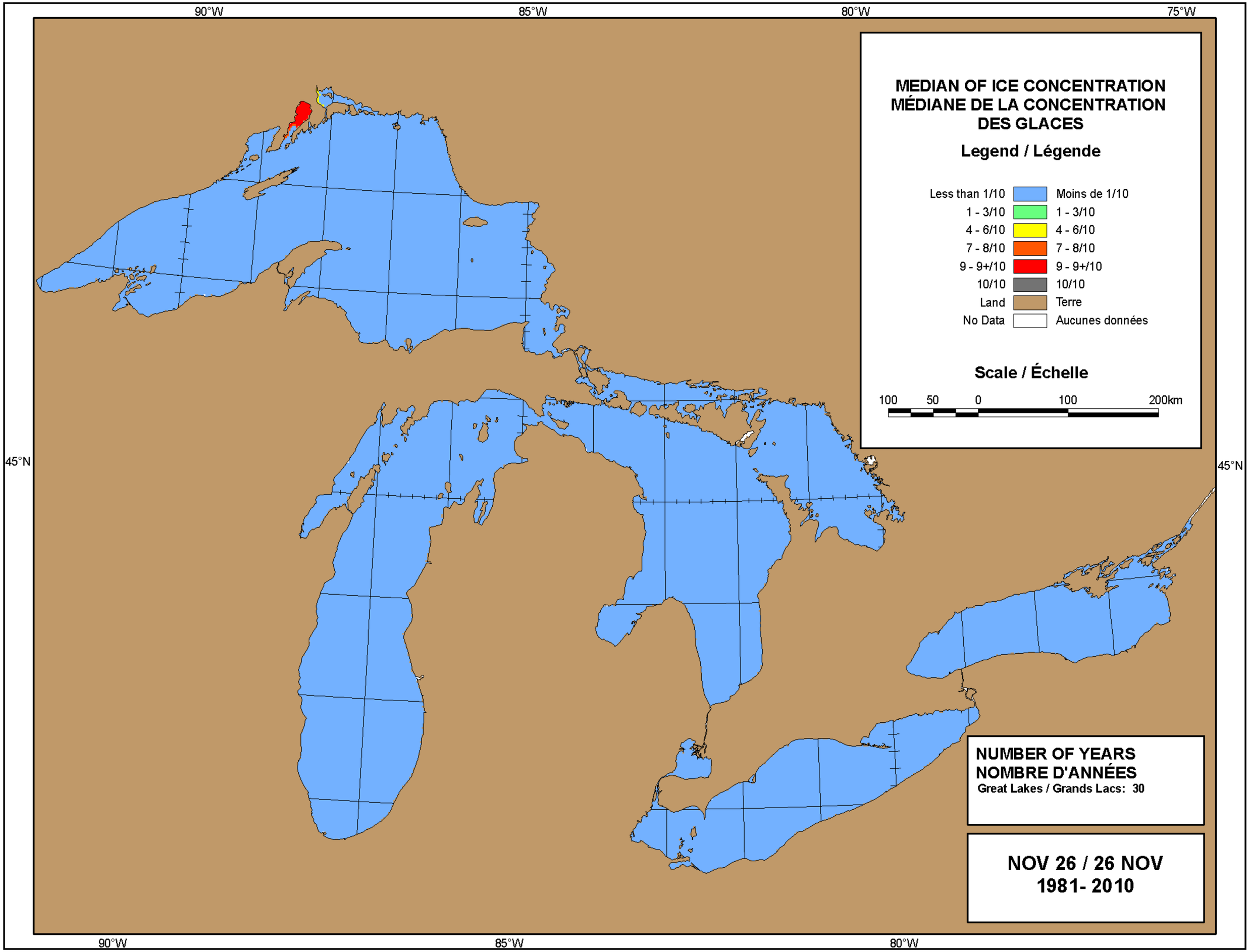

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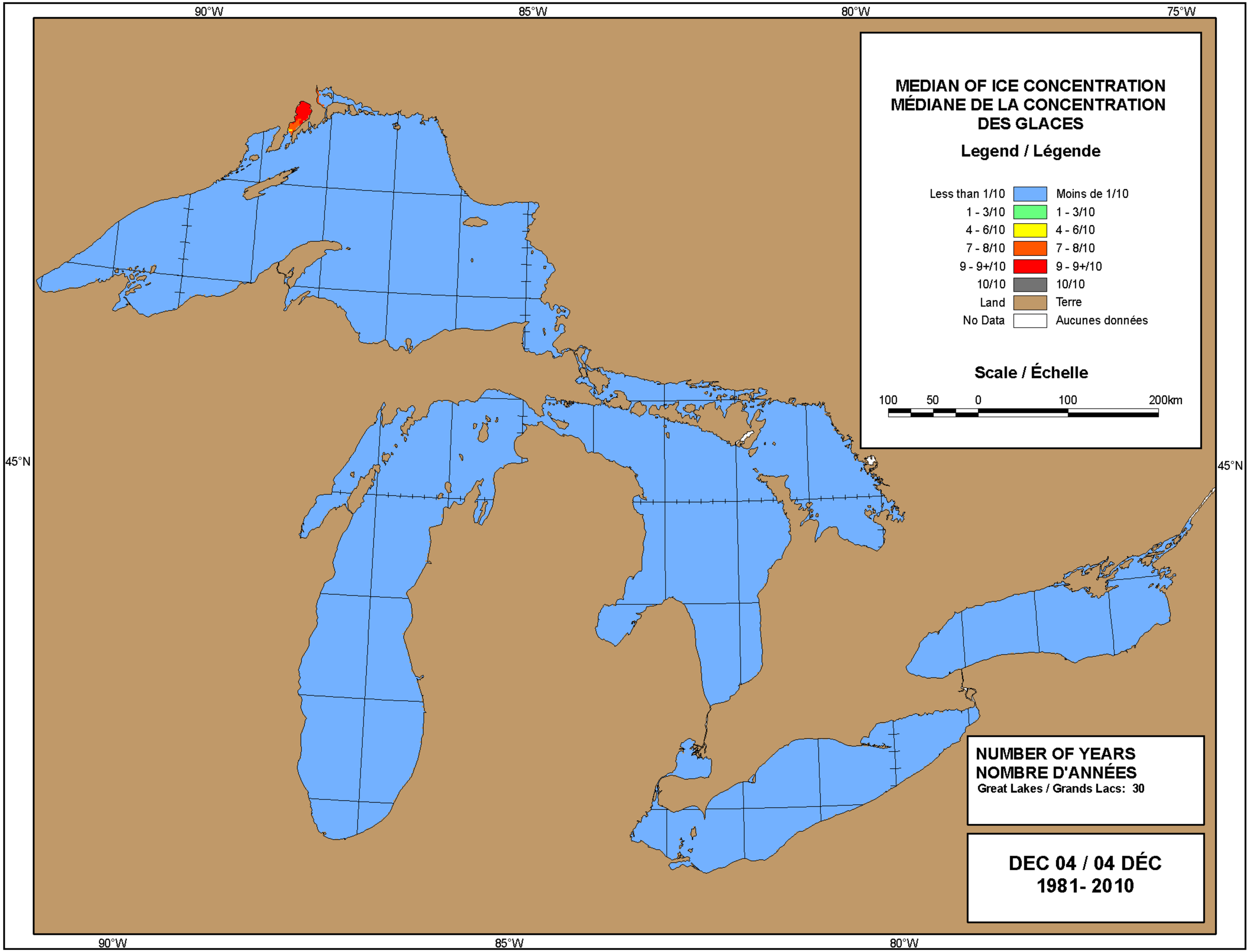
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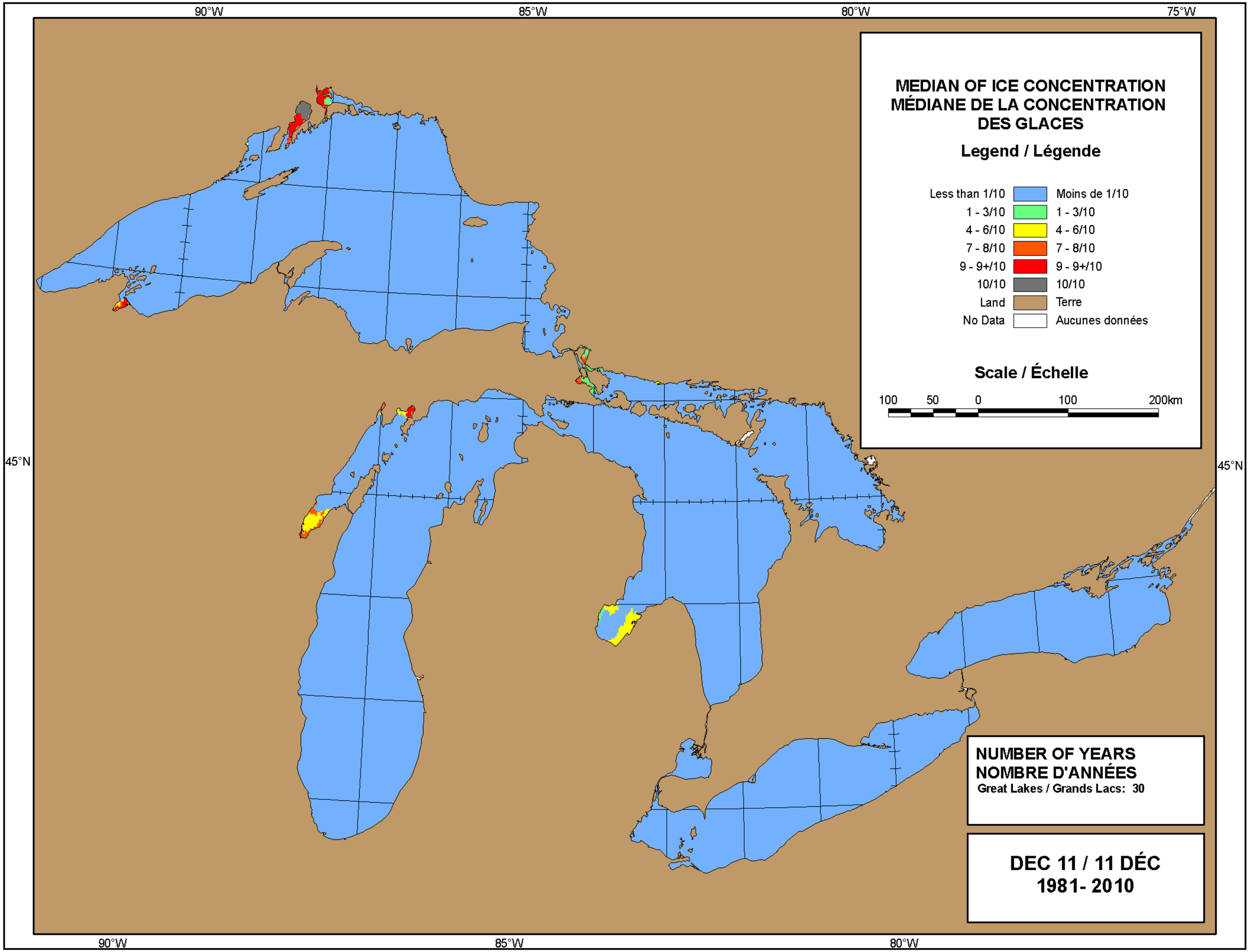

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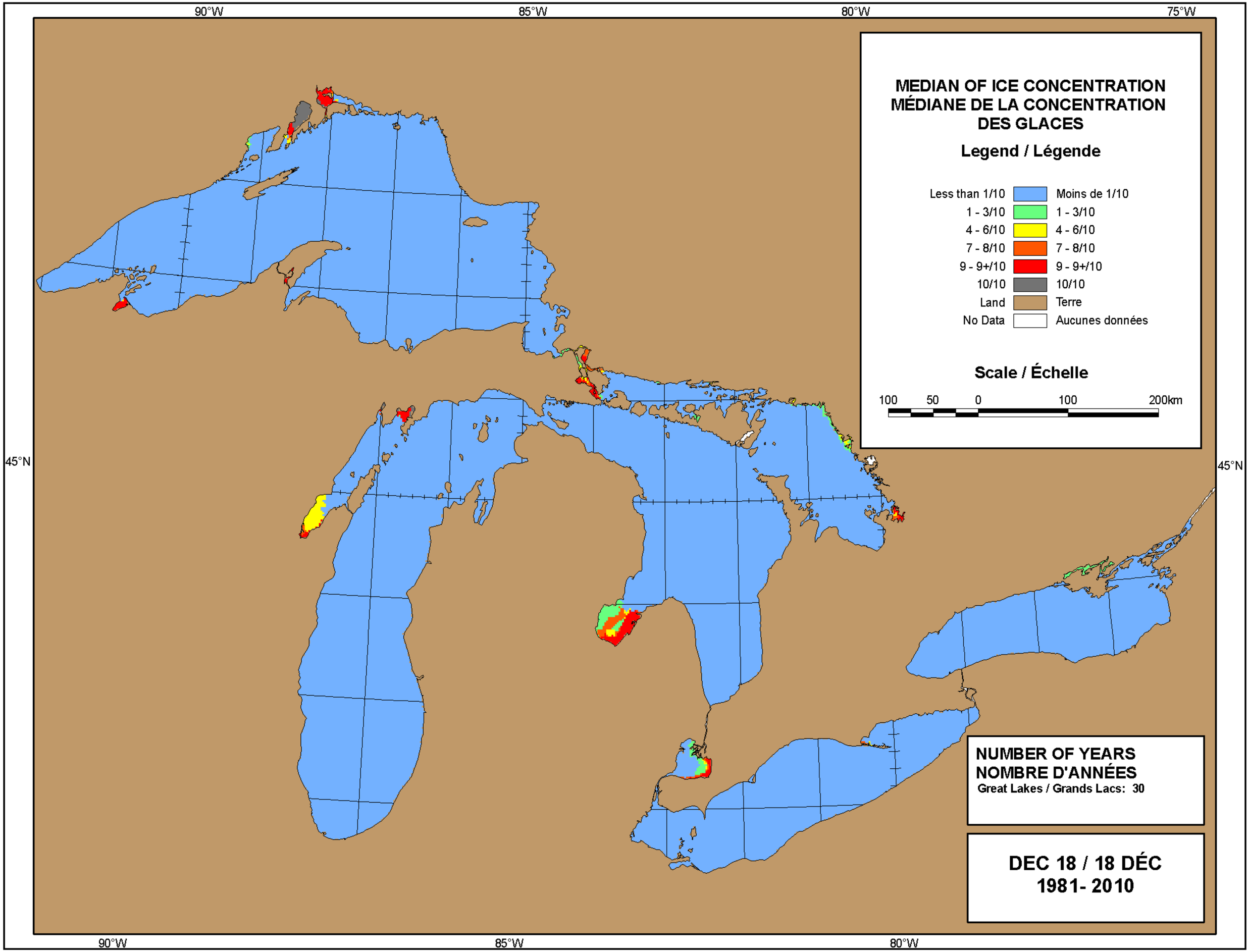
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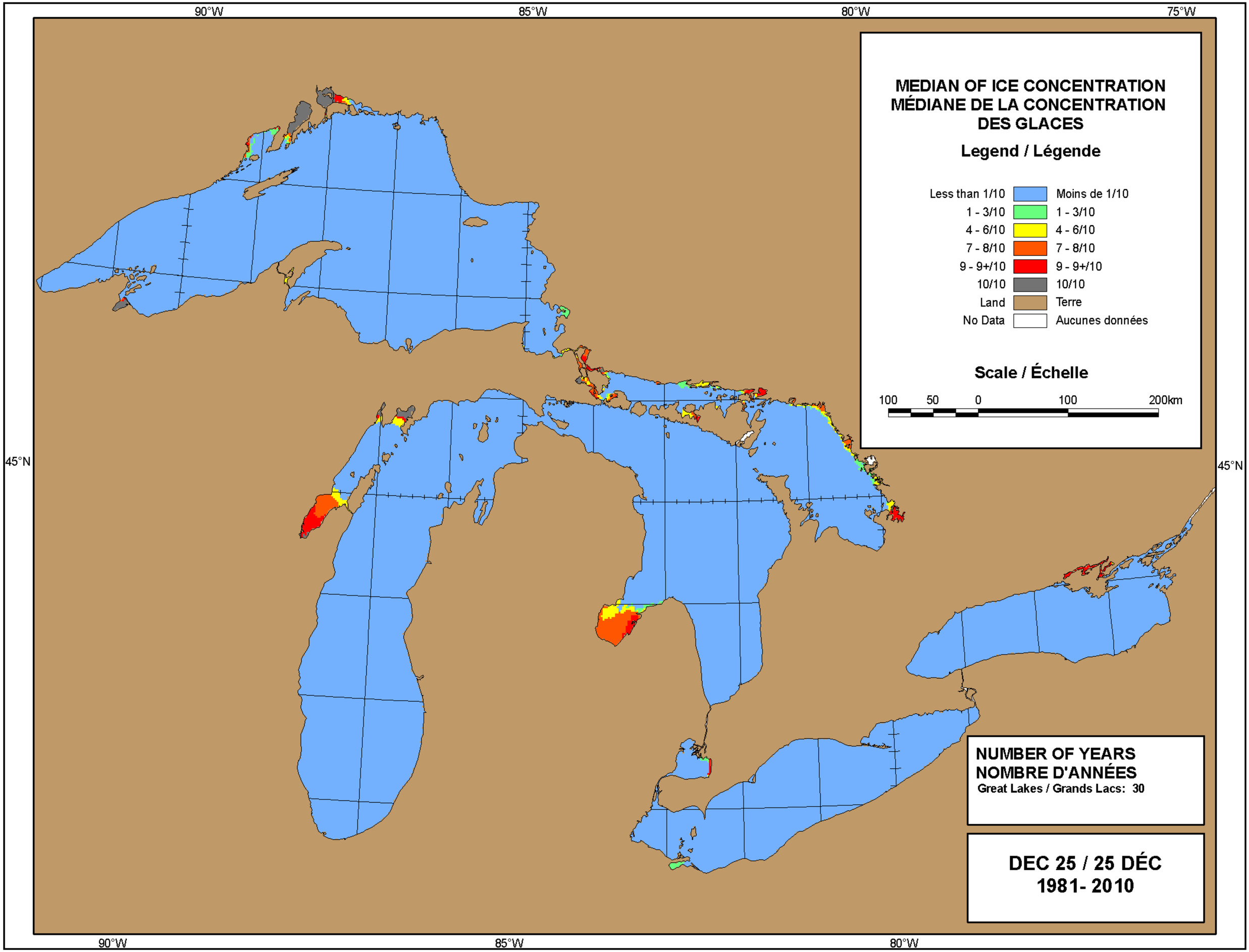
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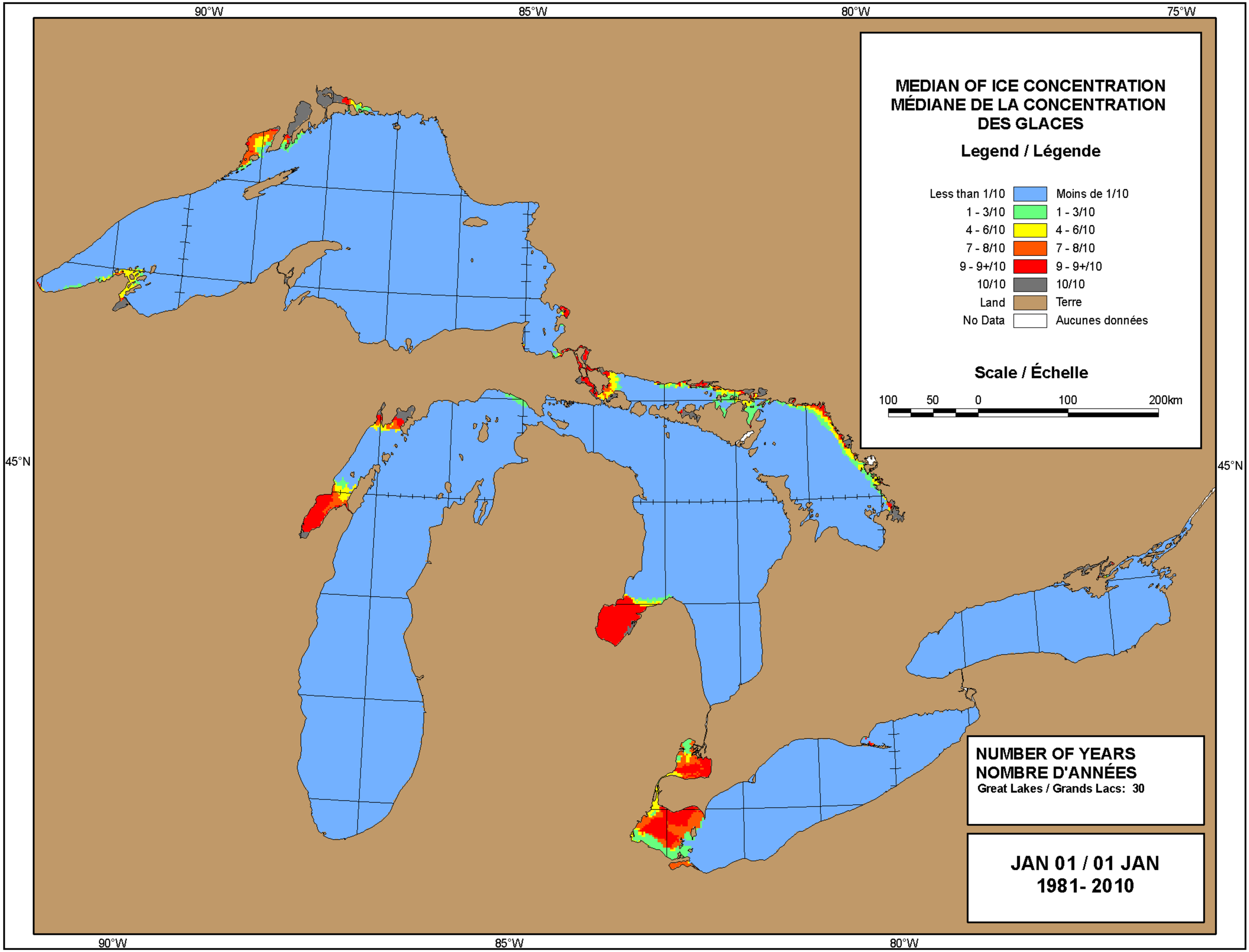
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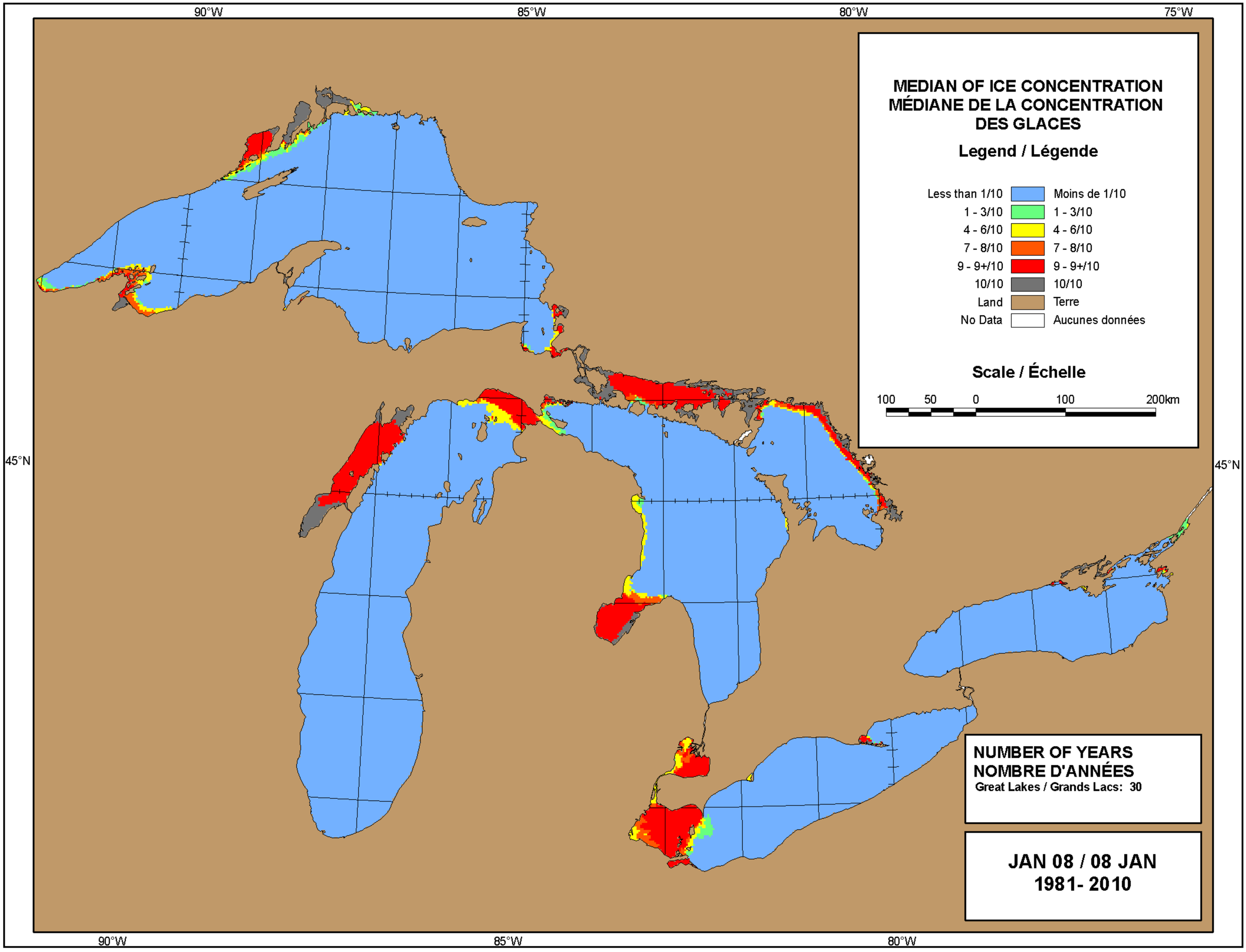
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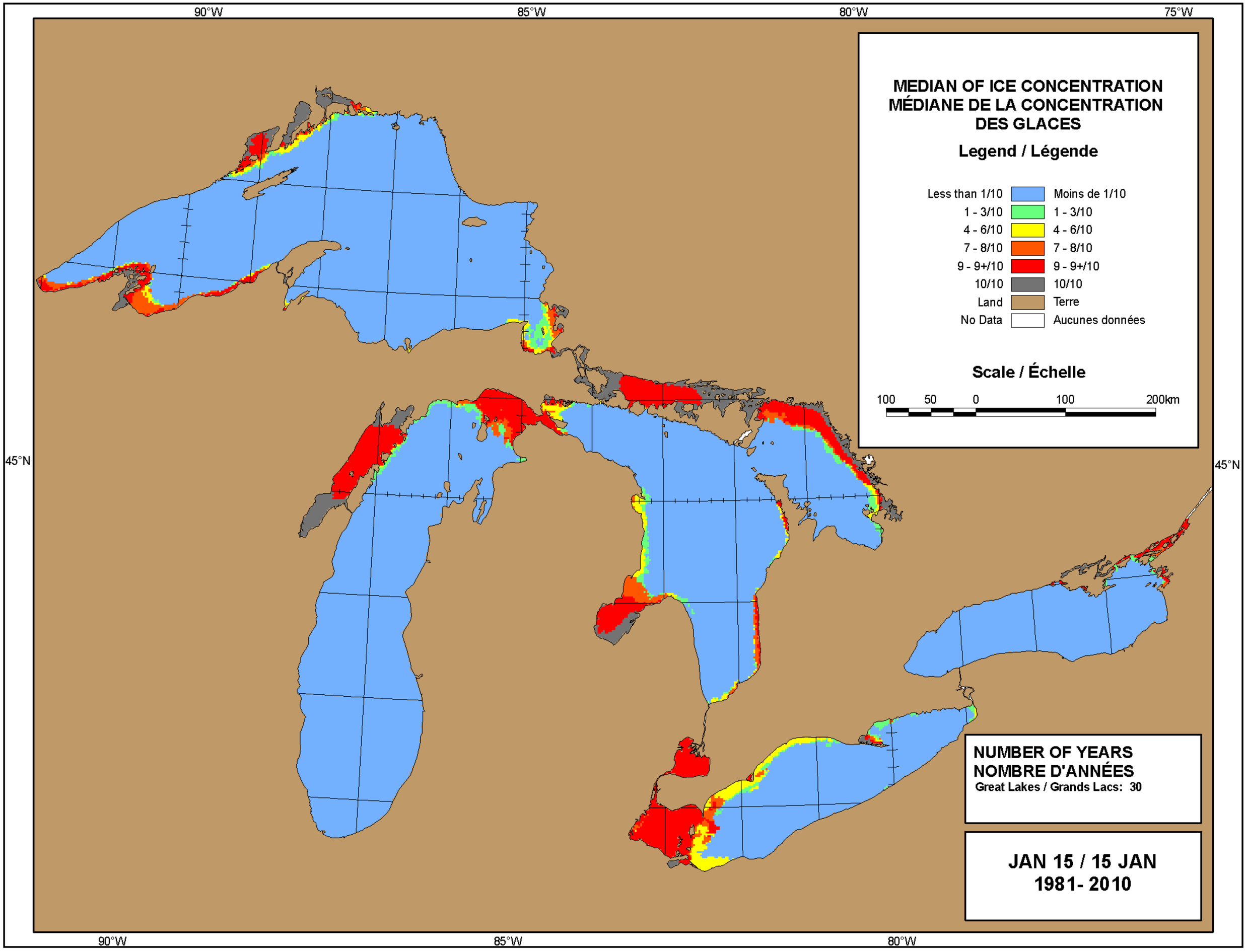
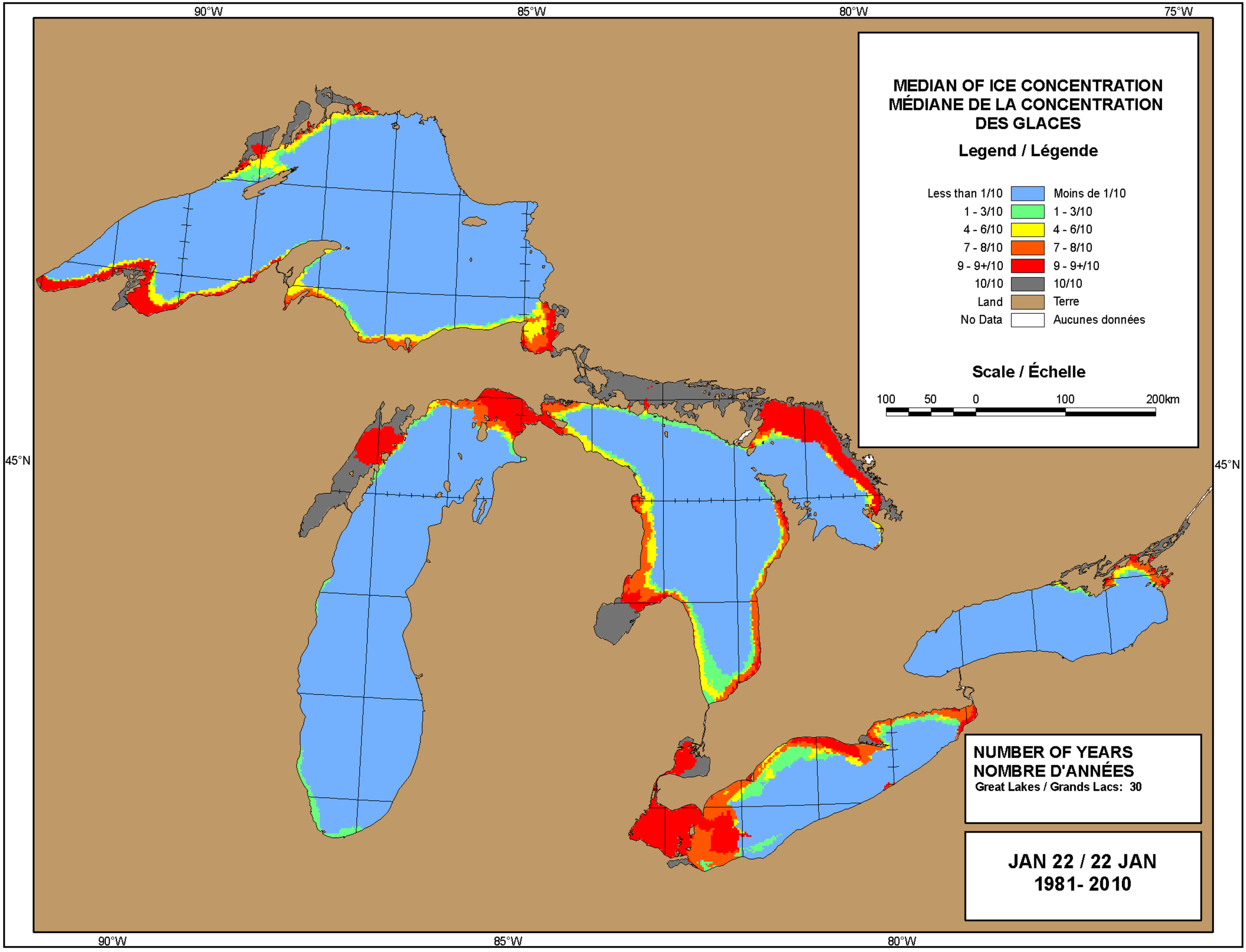
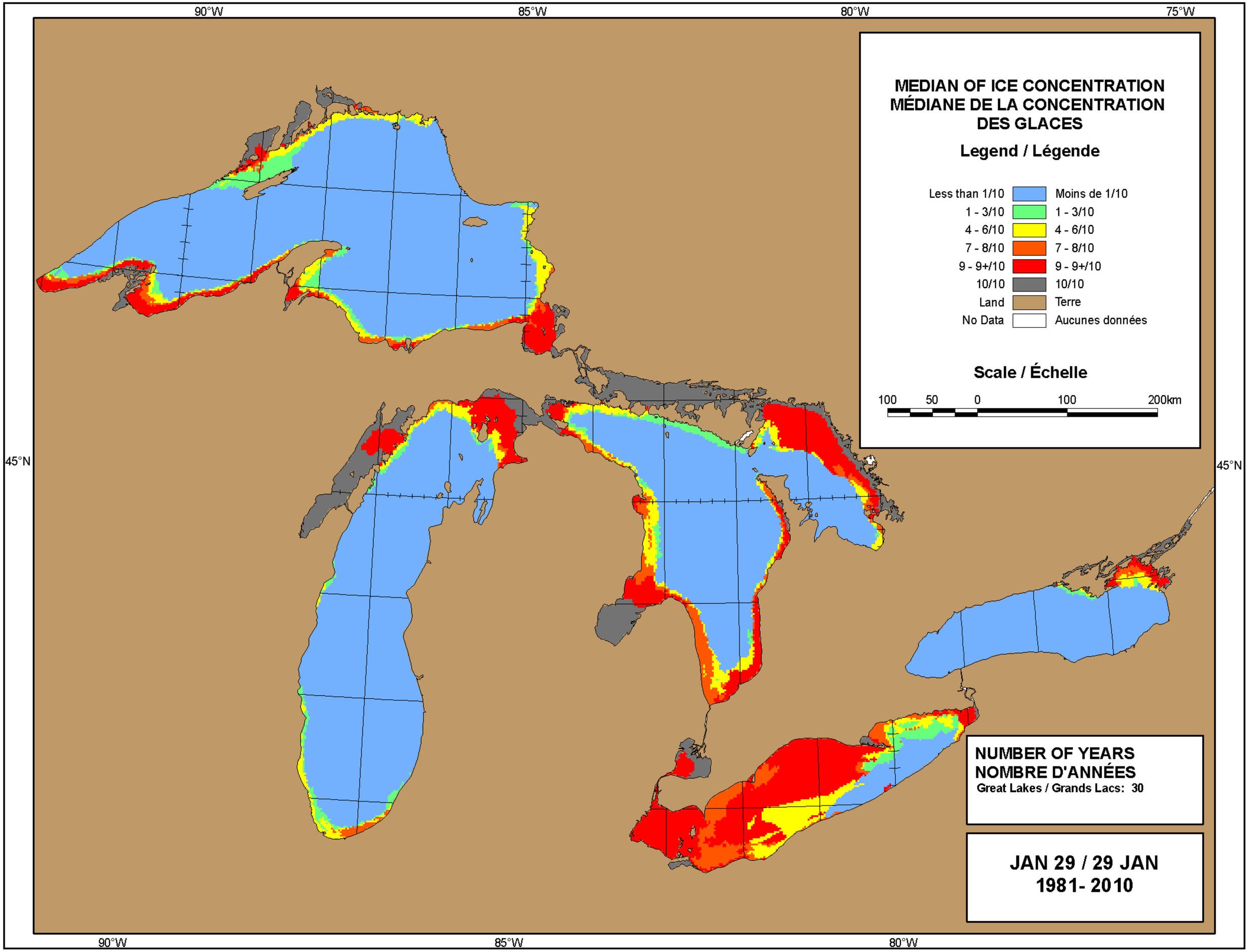
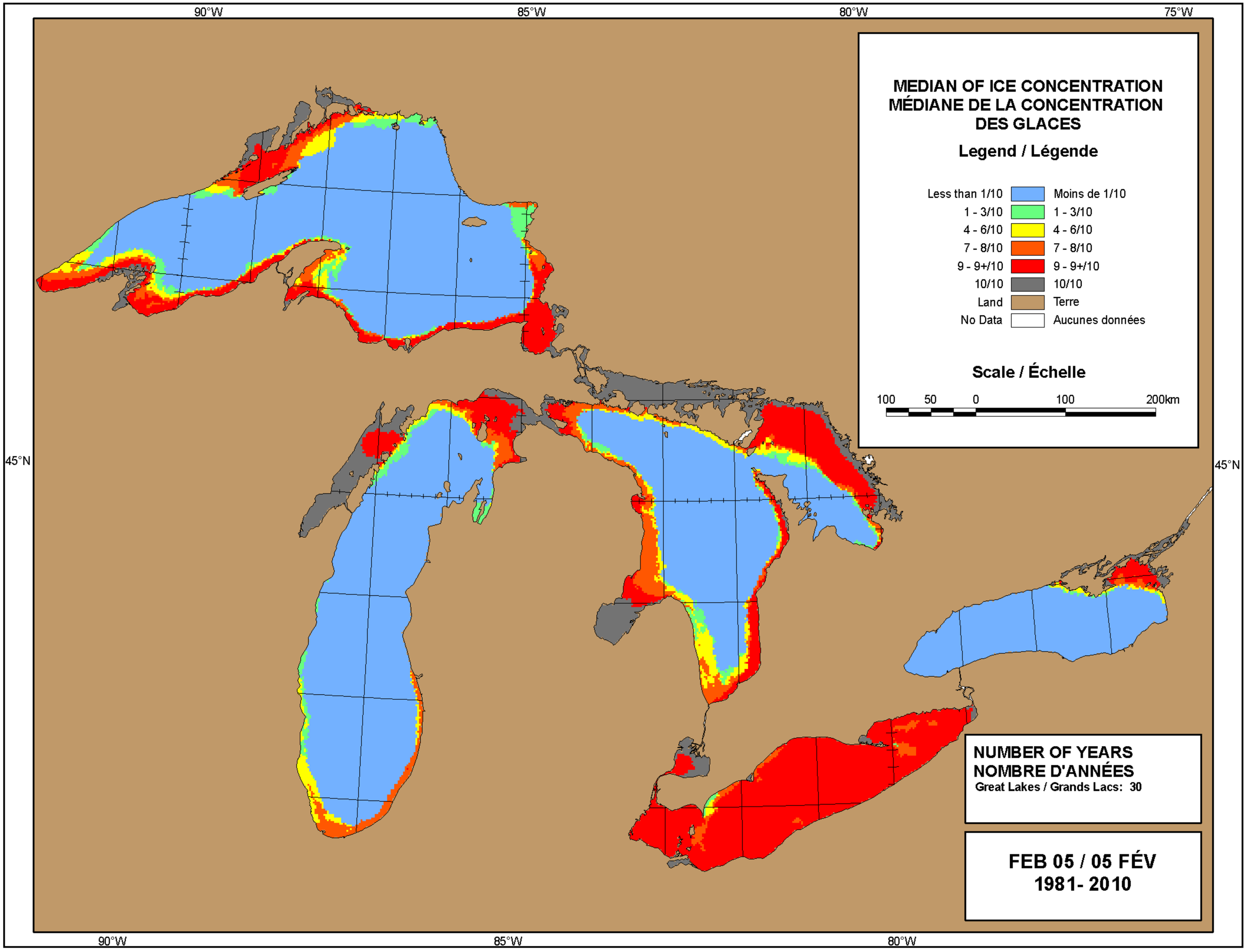
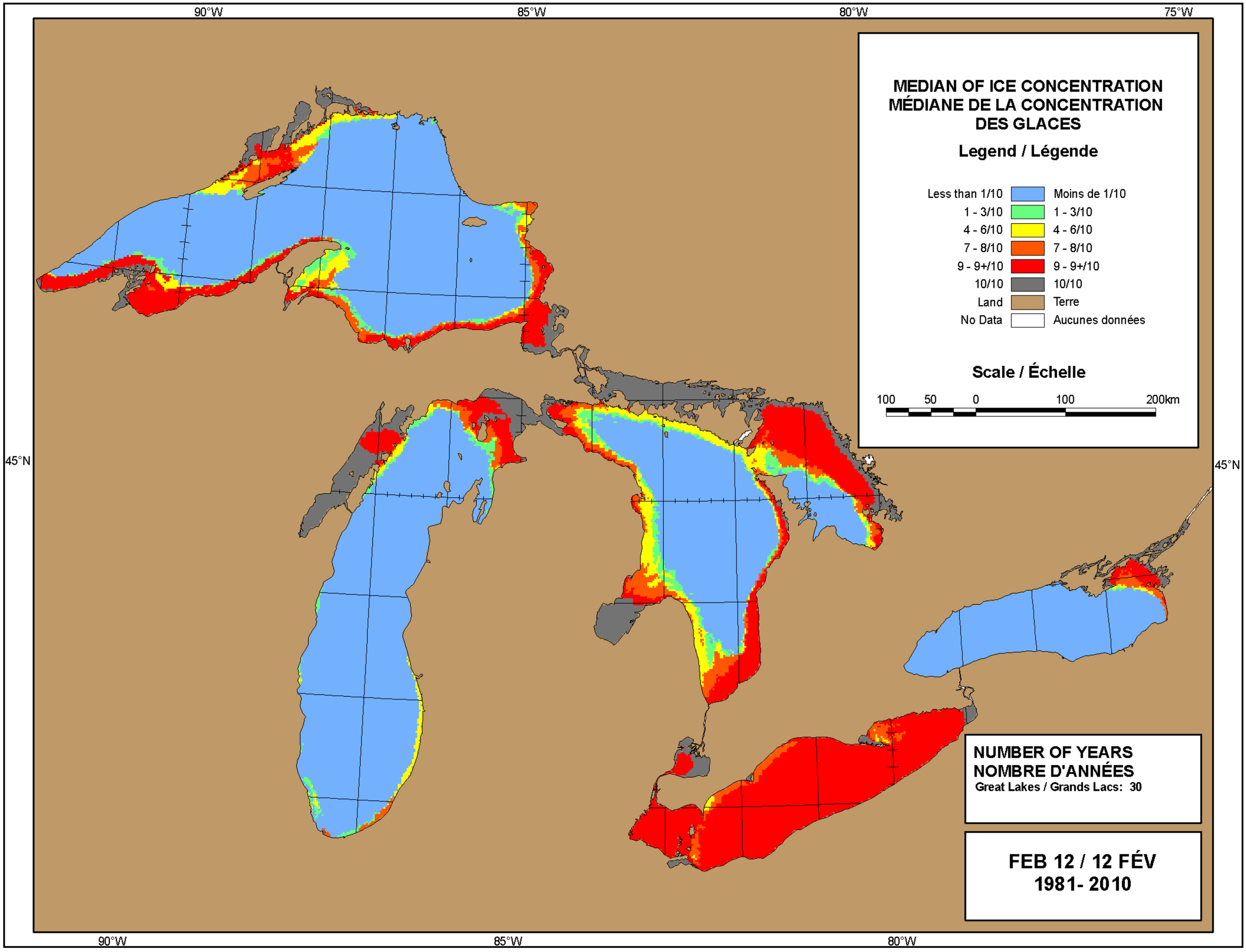


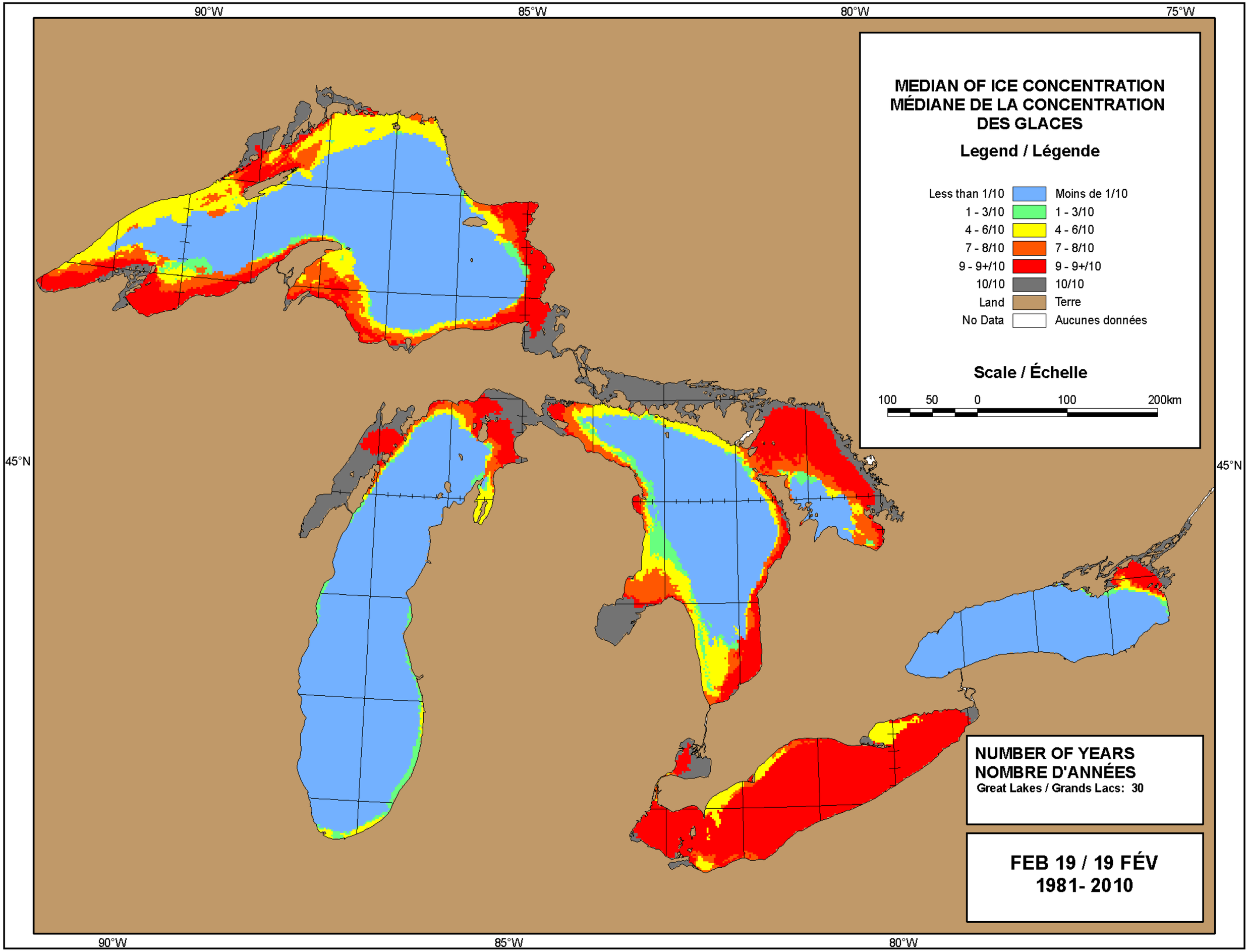
Canada

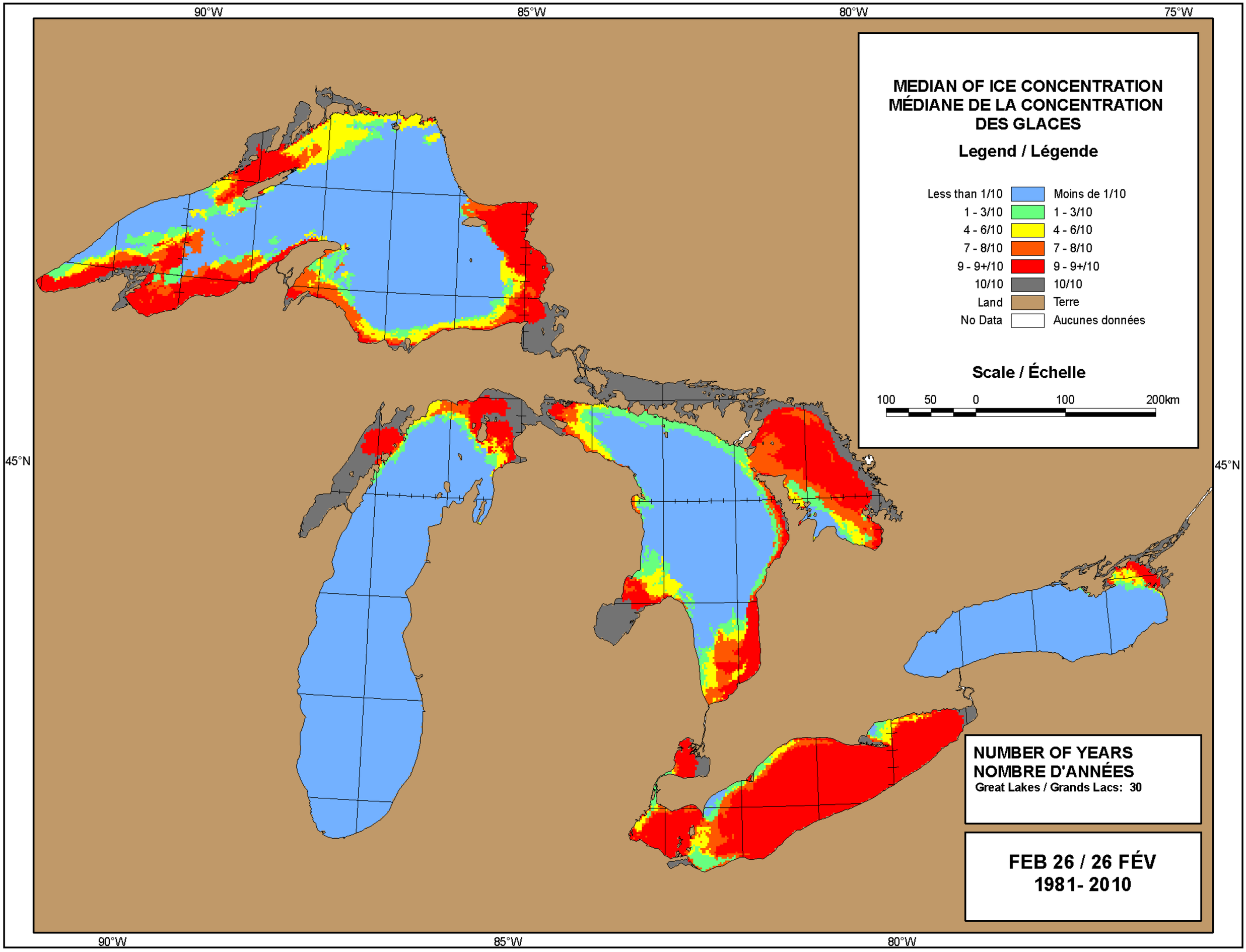

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 22 / 22 JAN
1981- 2010

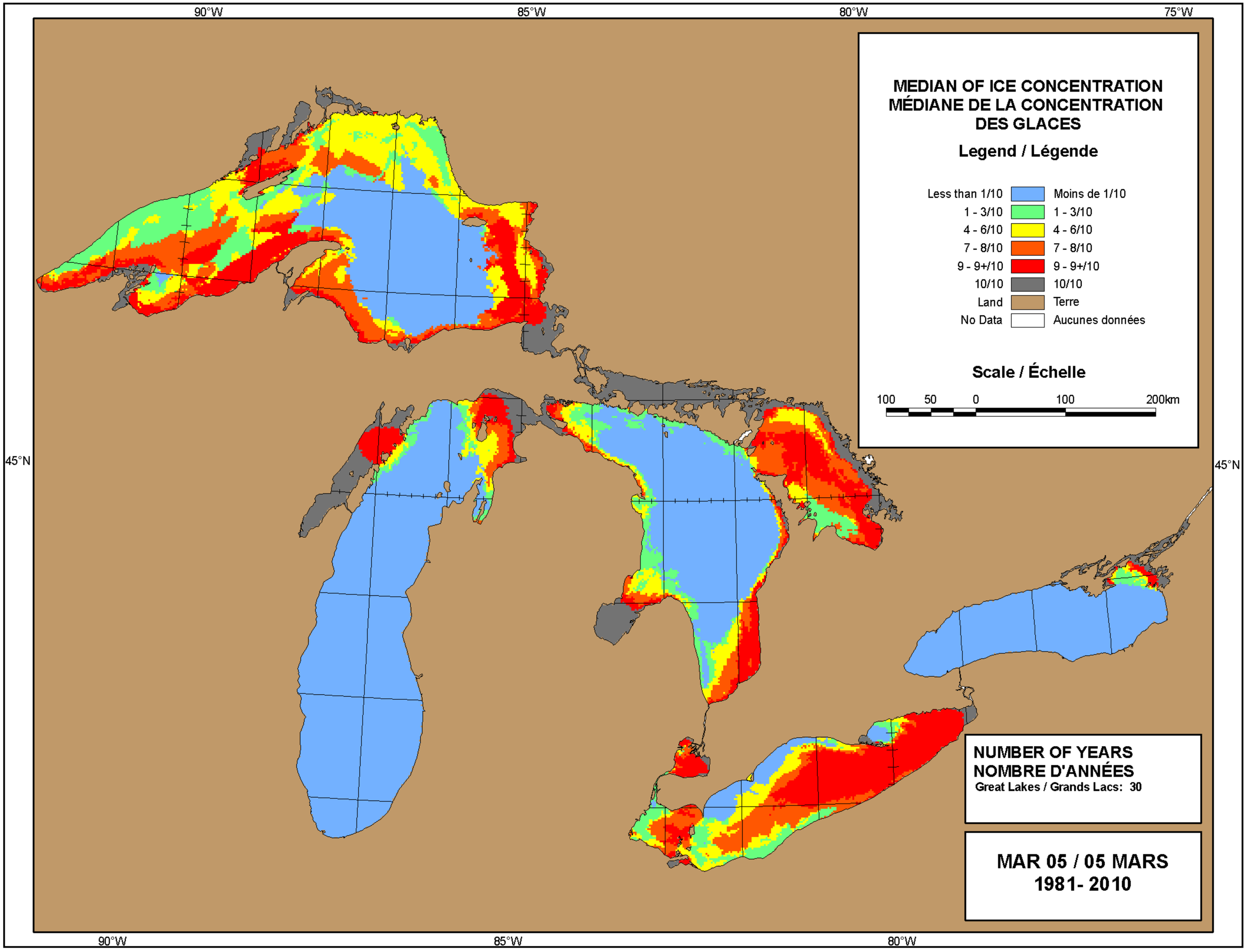

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 29 / 29 JAN
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 05 / 05 FÉV
1981- 2010

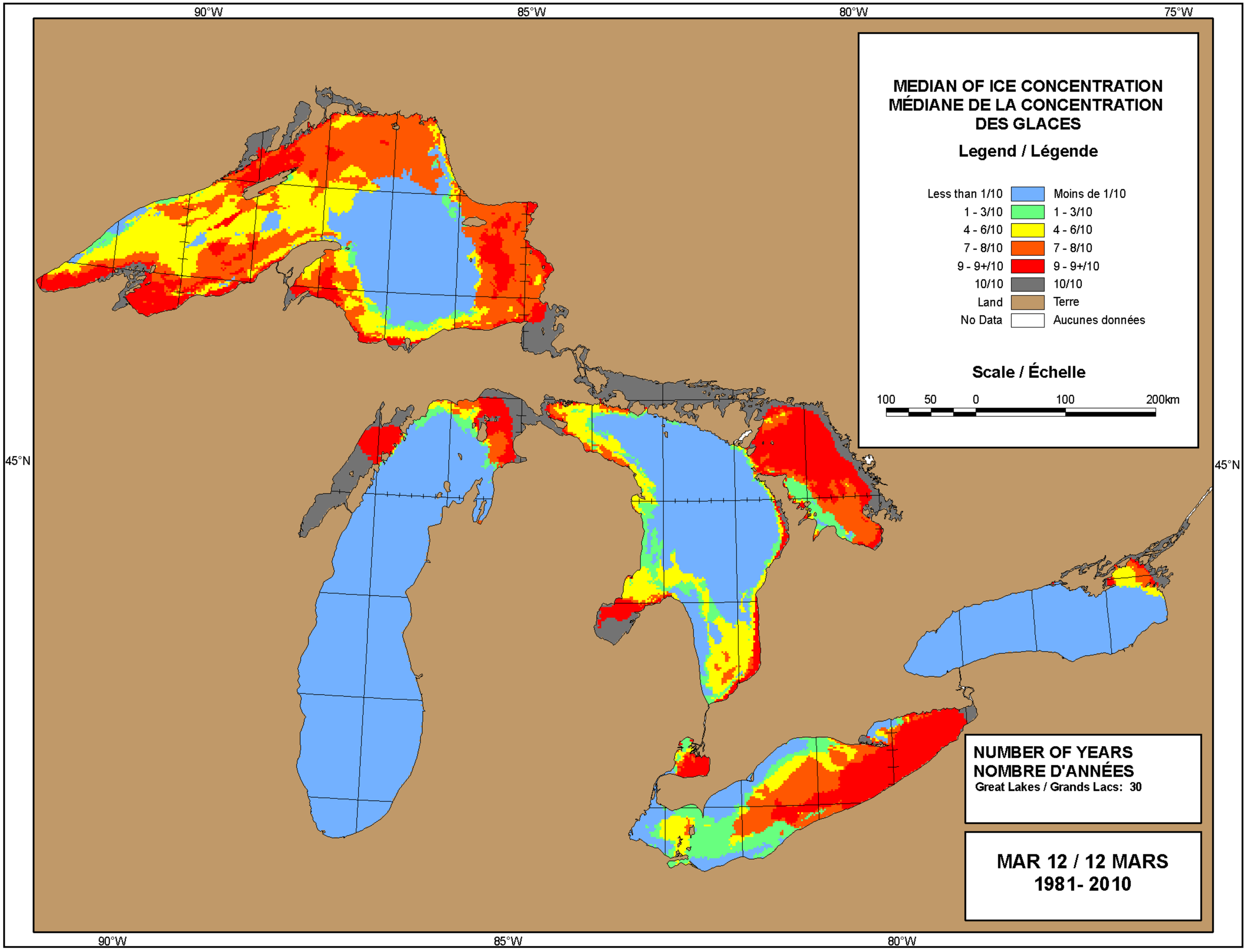

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 12 / 12 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 19 / 19 FÉV
1981- 2010

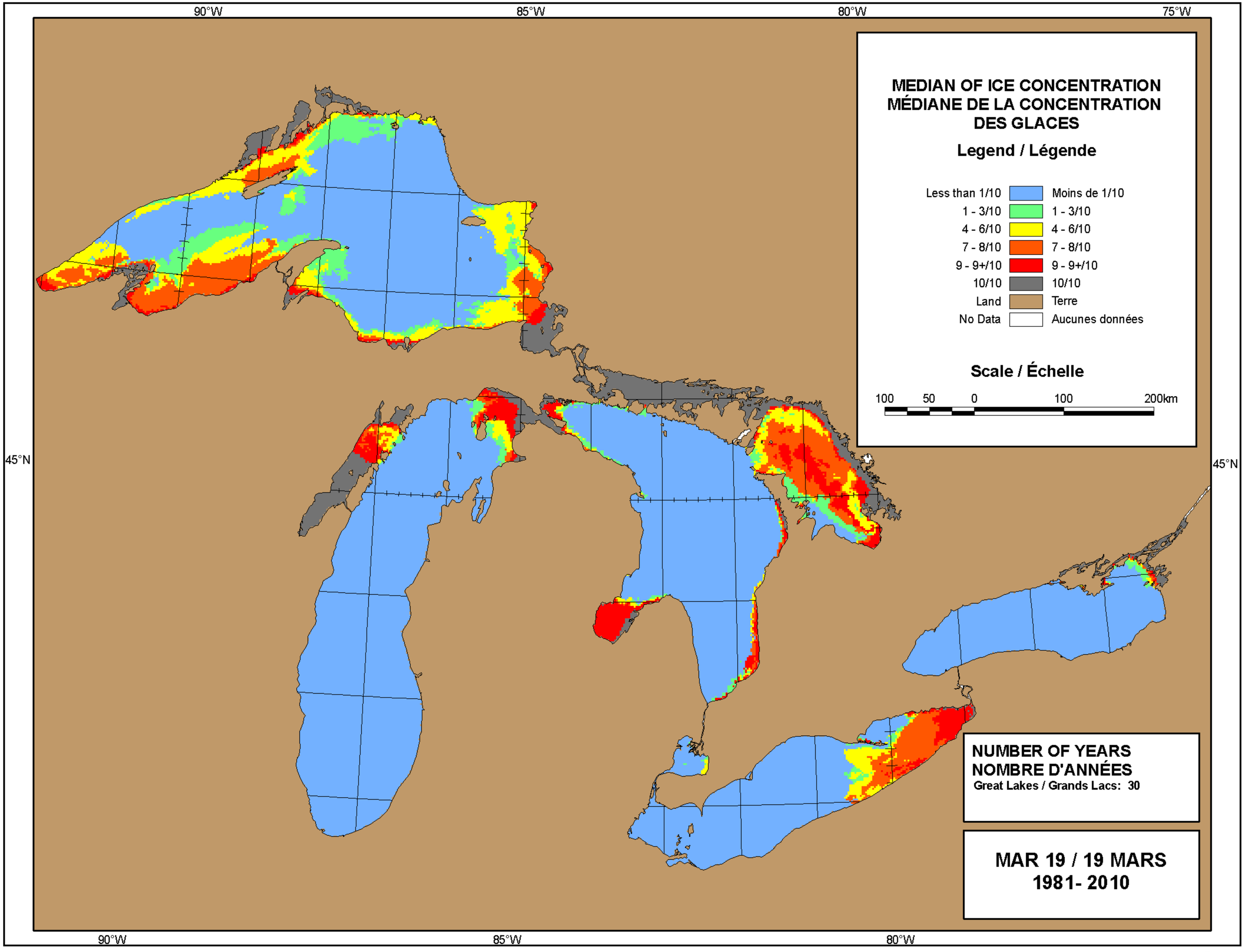

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 26 / 26 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 05 / 05 MARS
1981- 2010

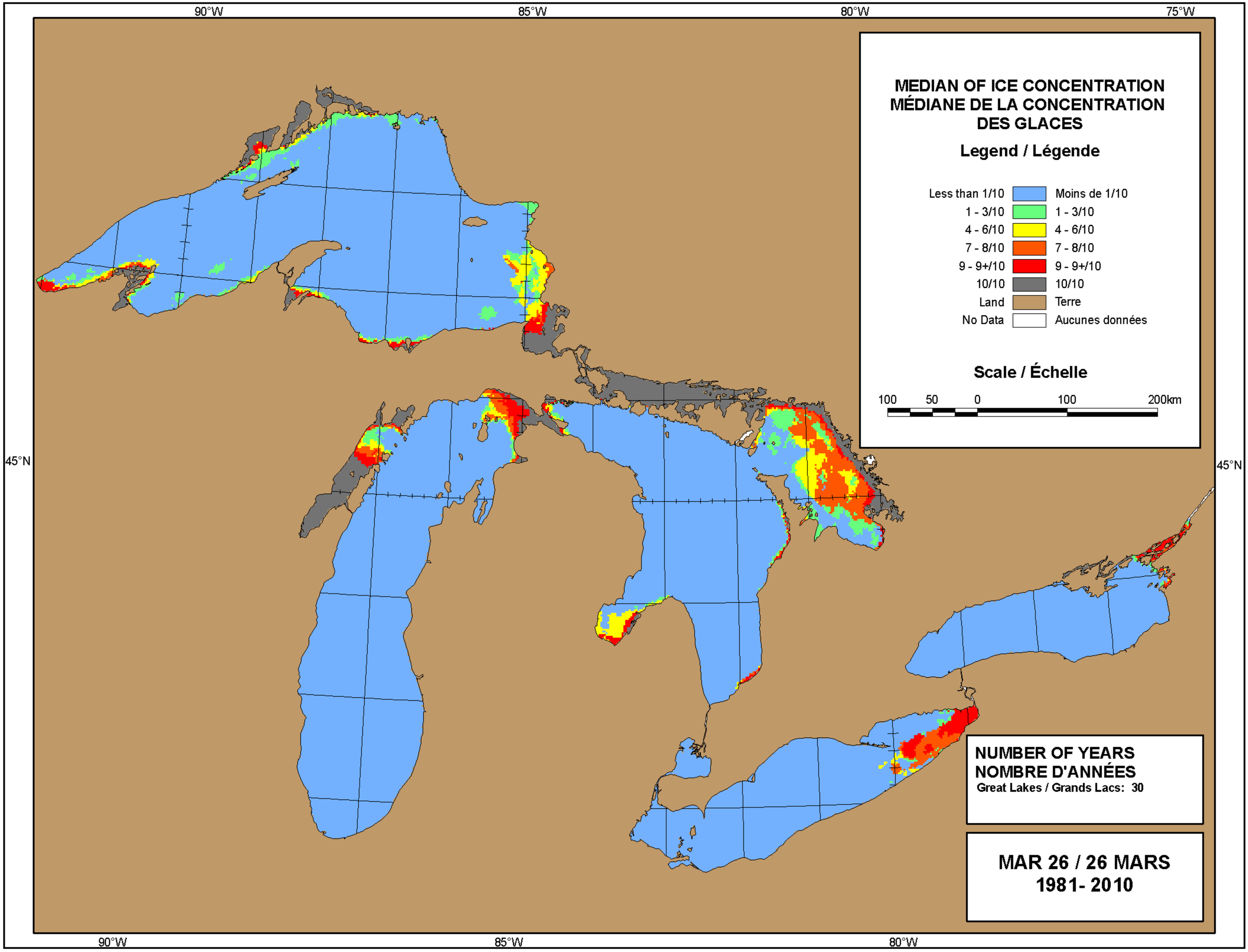
Environment Canada Environnement Canada



Canada


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 19 / 19 MARS
1981- 2010

Environment Canada Environnement Canada



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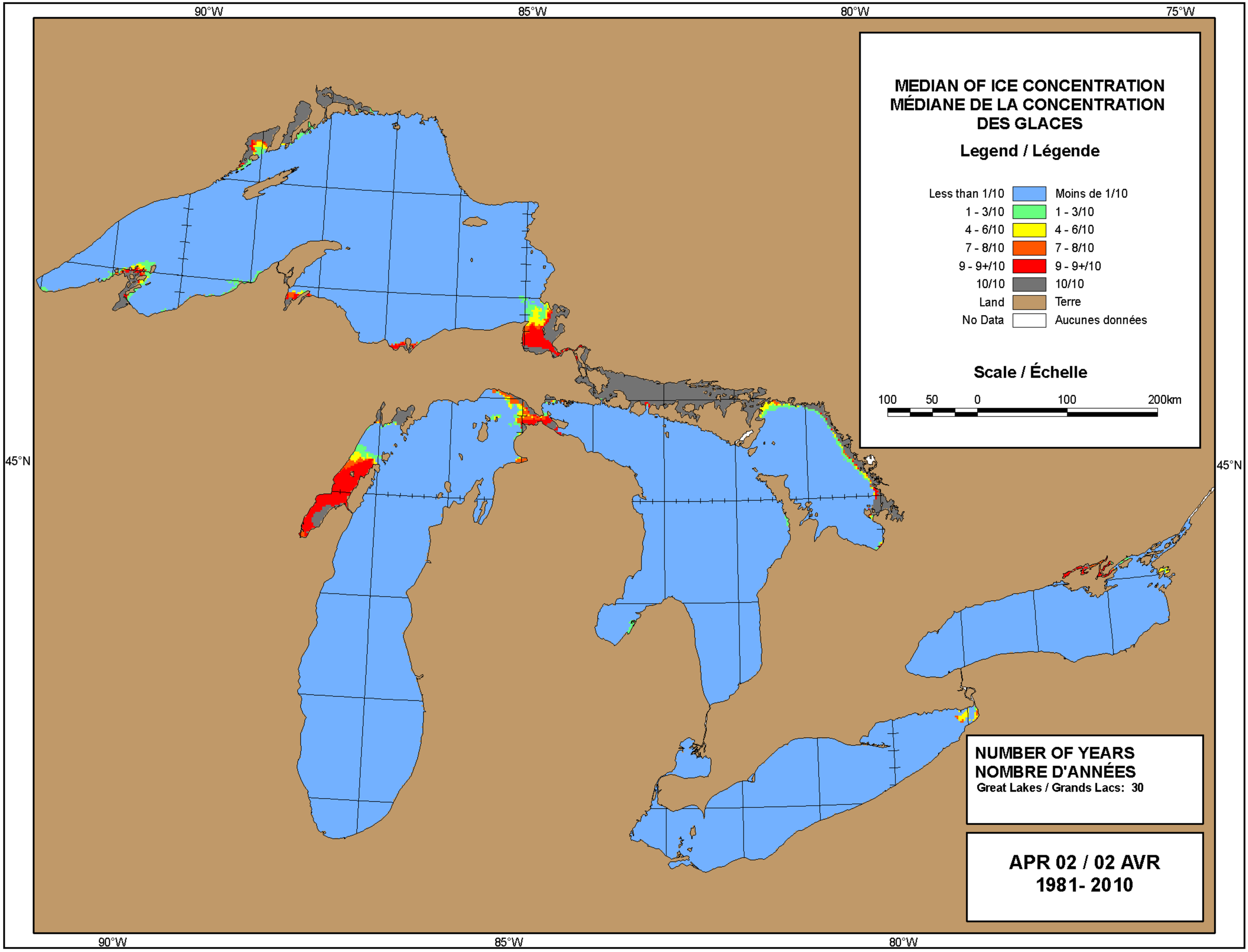
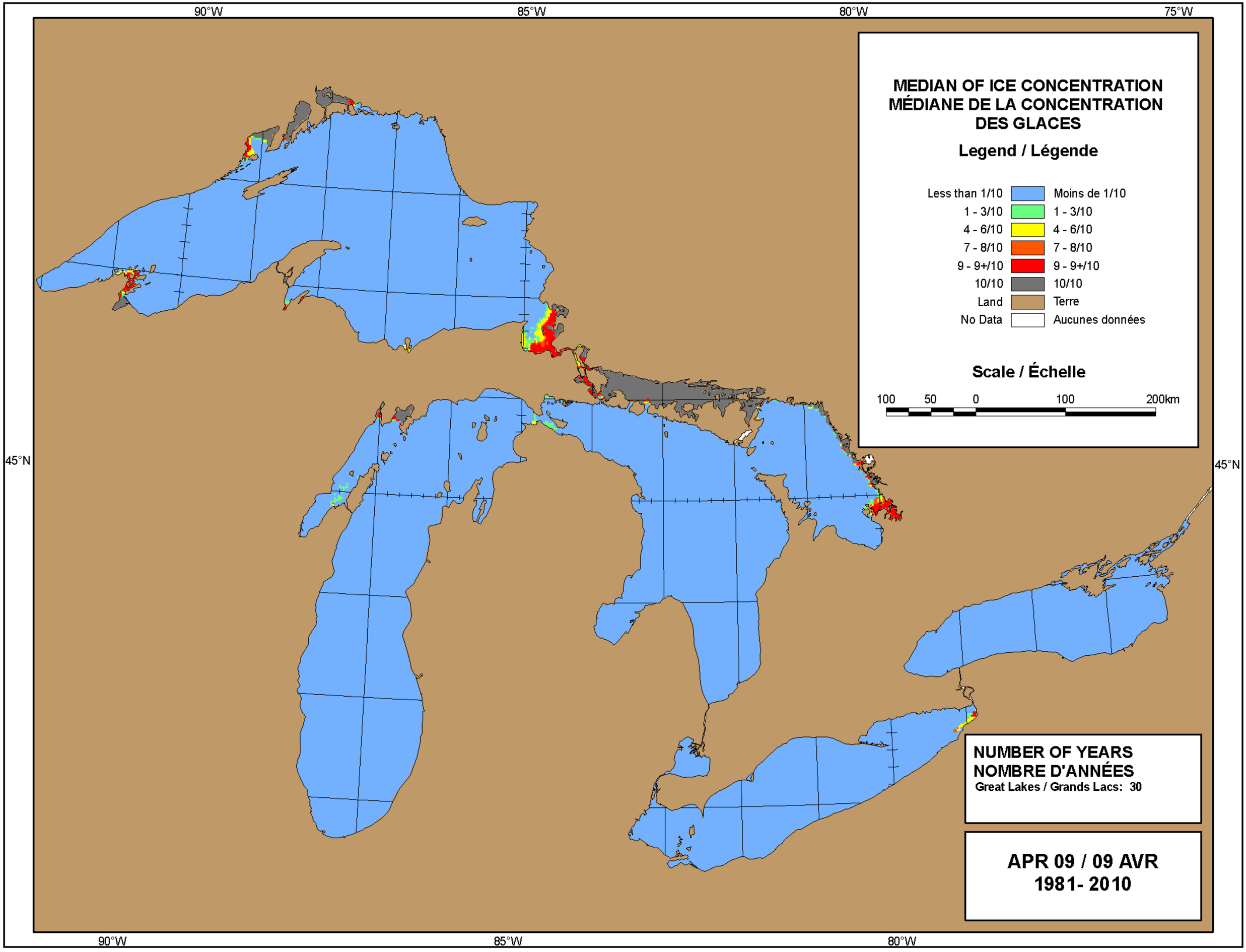
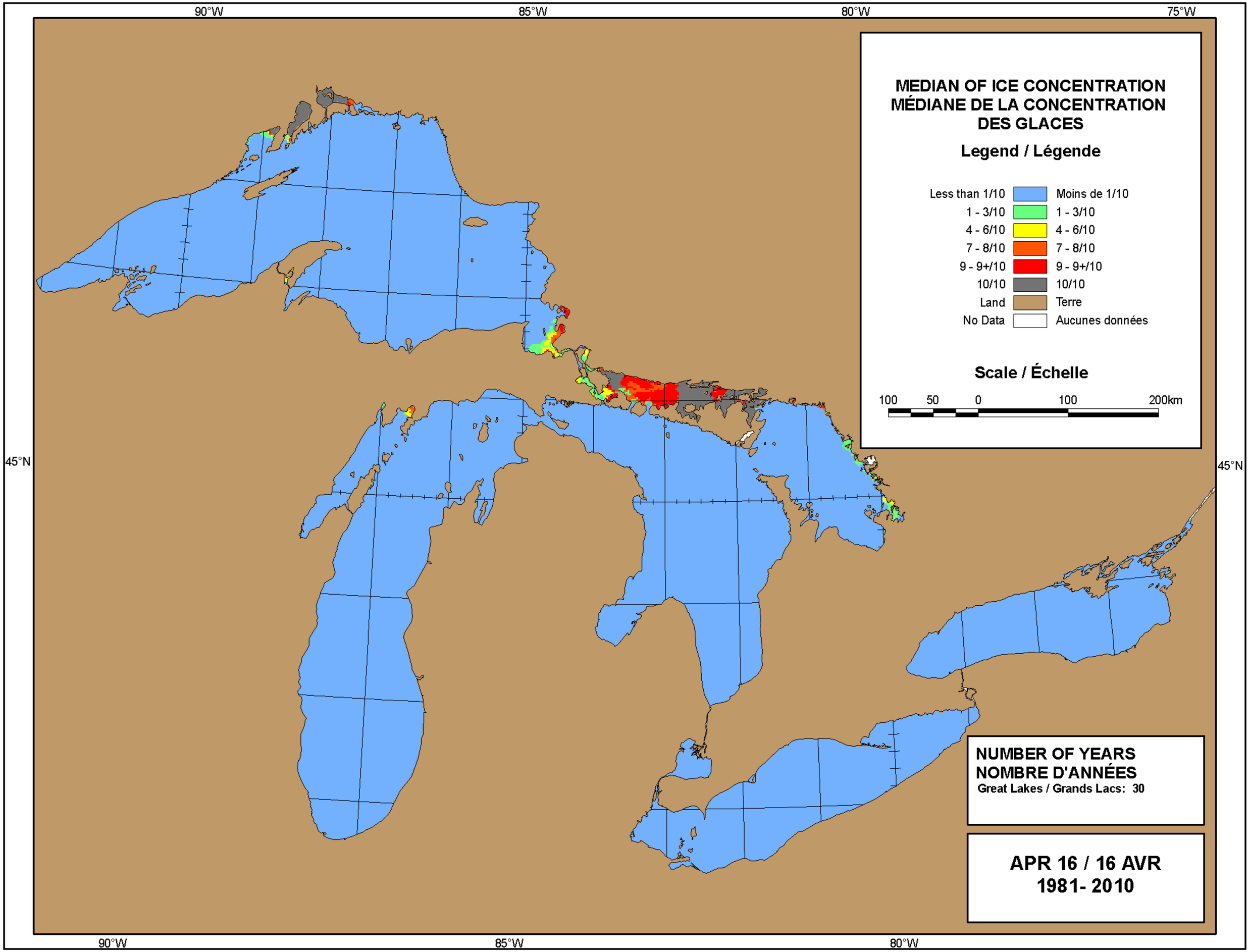
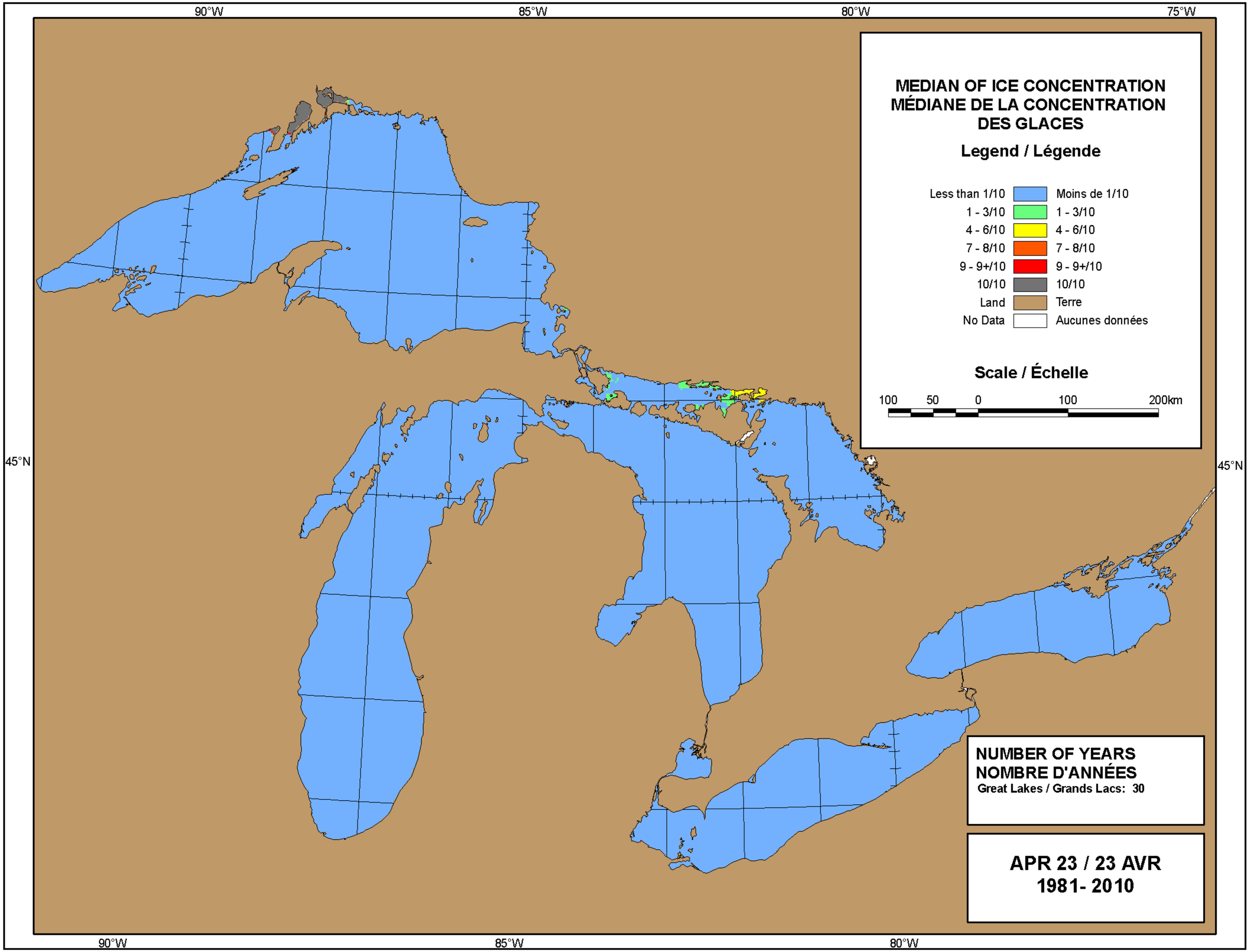
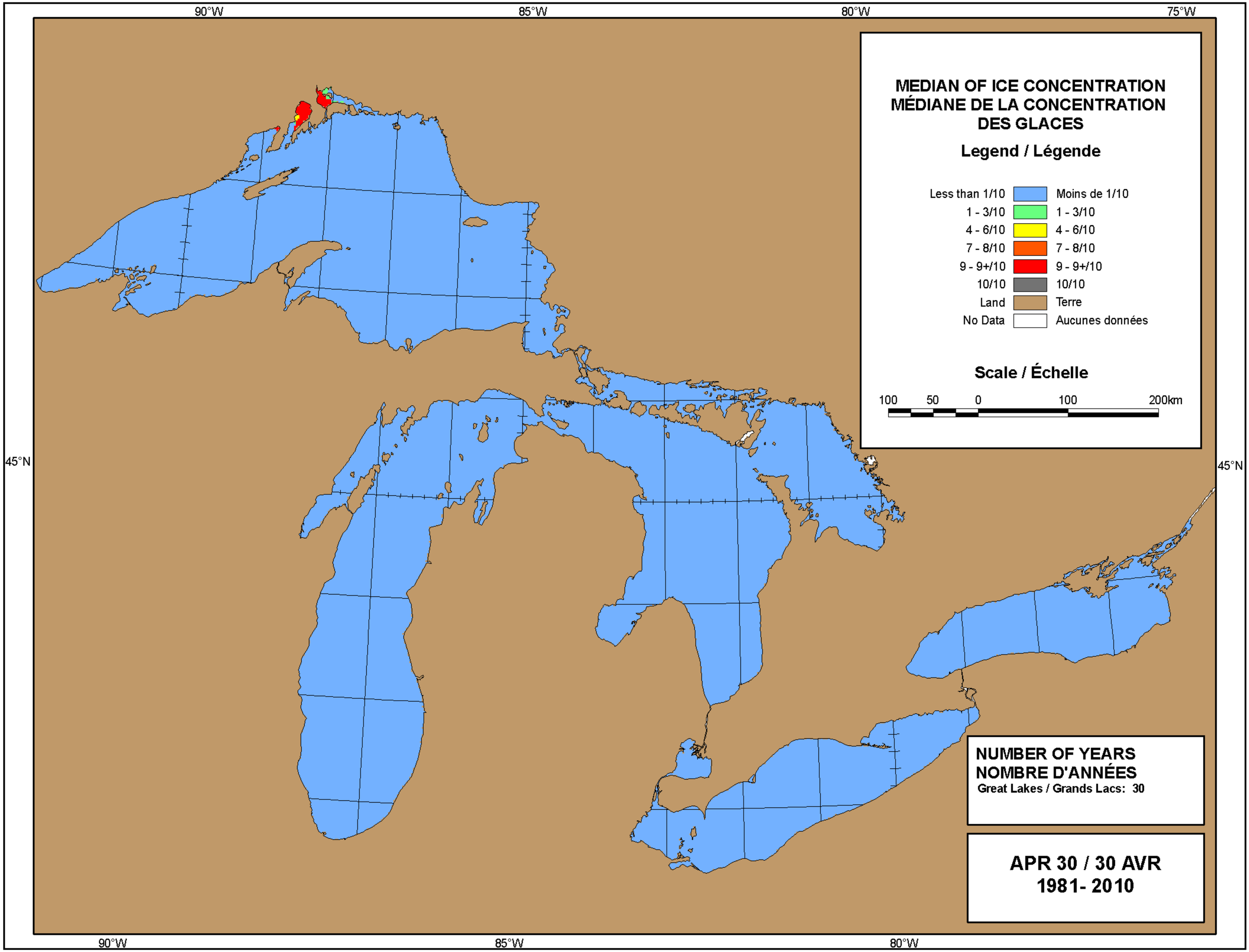

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 02 / 02 AVR
1981- 2010

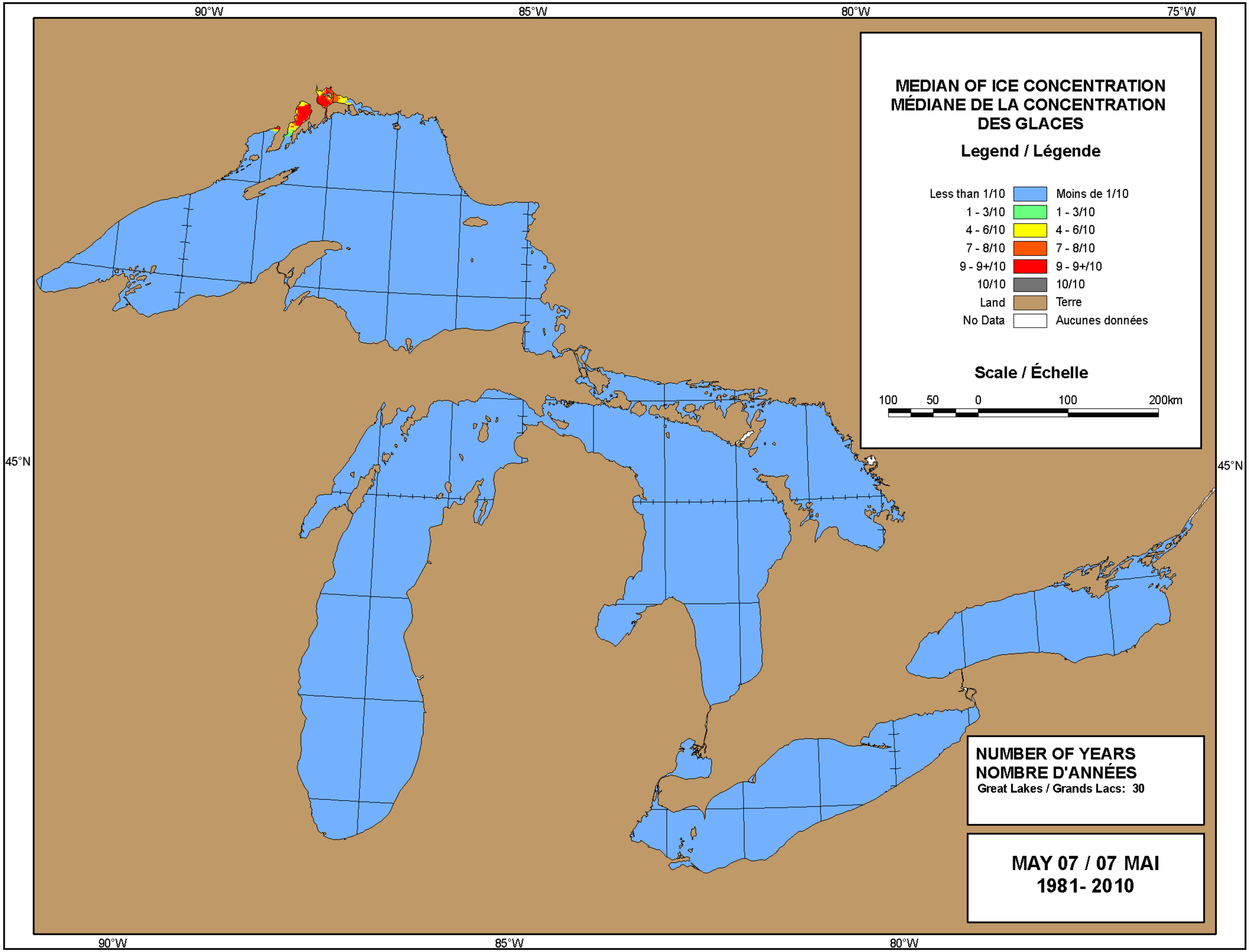

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 09 / 09 AVR
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 16 / 16 AVR
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 23 / 23 AVR
1981- 2010

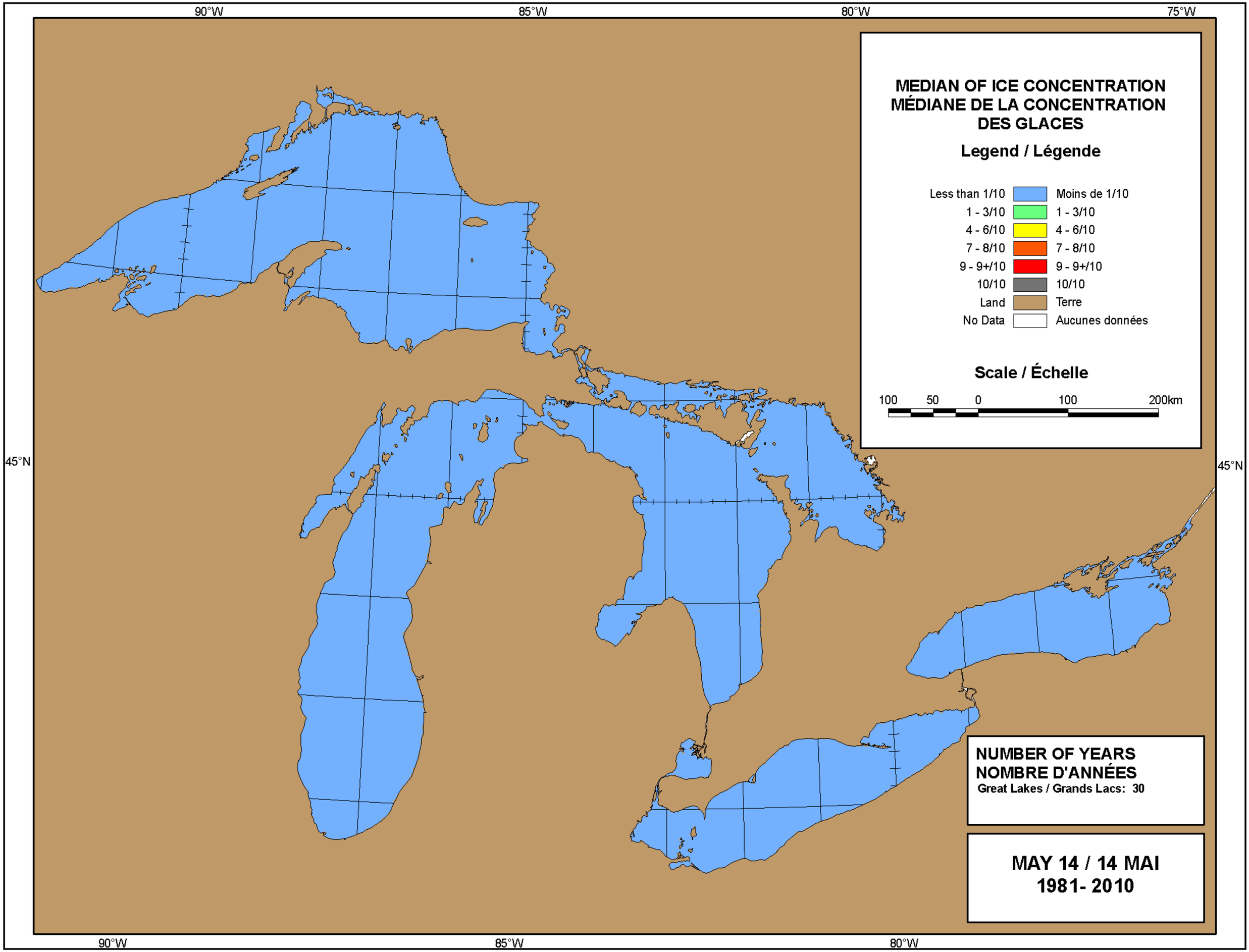

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION DES GLACES
Legend / Légende
Less than 1/10 Moins de 1/10
1 - 3/10 1 - 3/10
4 - 6/10 4 - 6/10
7 - 8/10 7 - 8/10
9 - 9+/10 9 - 9+/10
10/10 10/10
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 30 / 30 AVR
1981- 2010

Environment Canada Environnement Canada



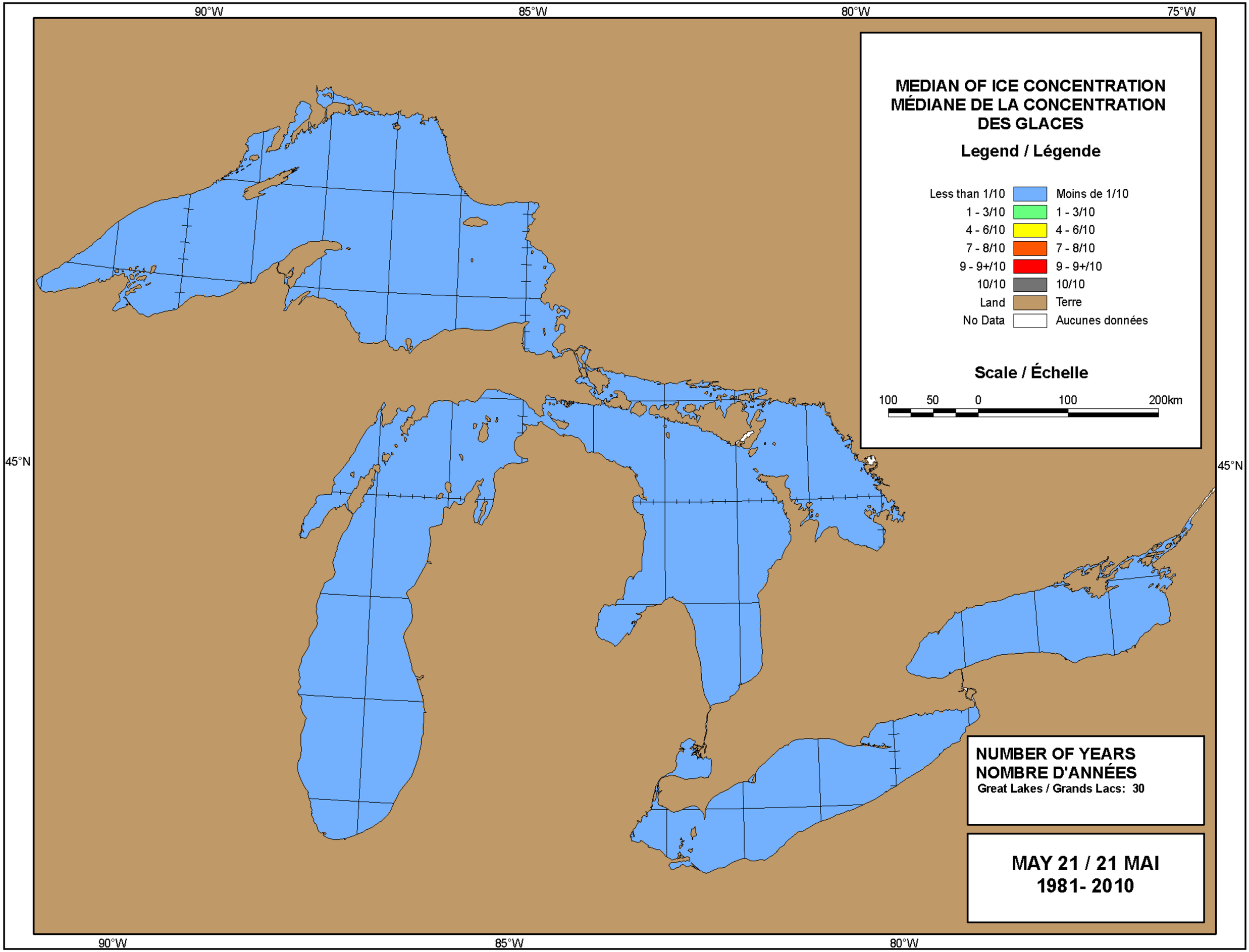
Canada

Environment Canada Environnement Canada



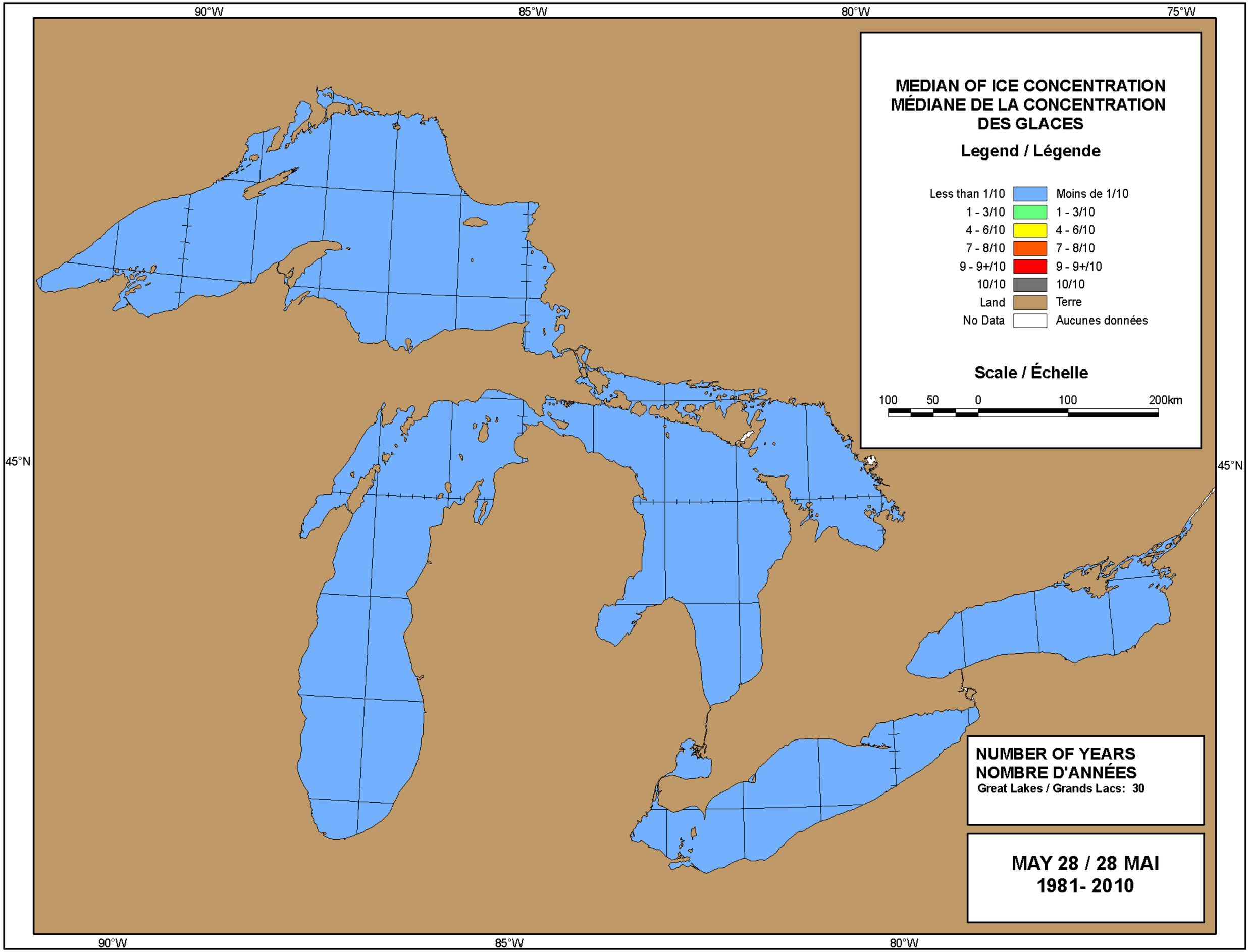
Canada

Environment Canada Environnement Canada

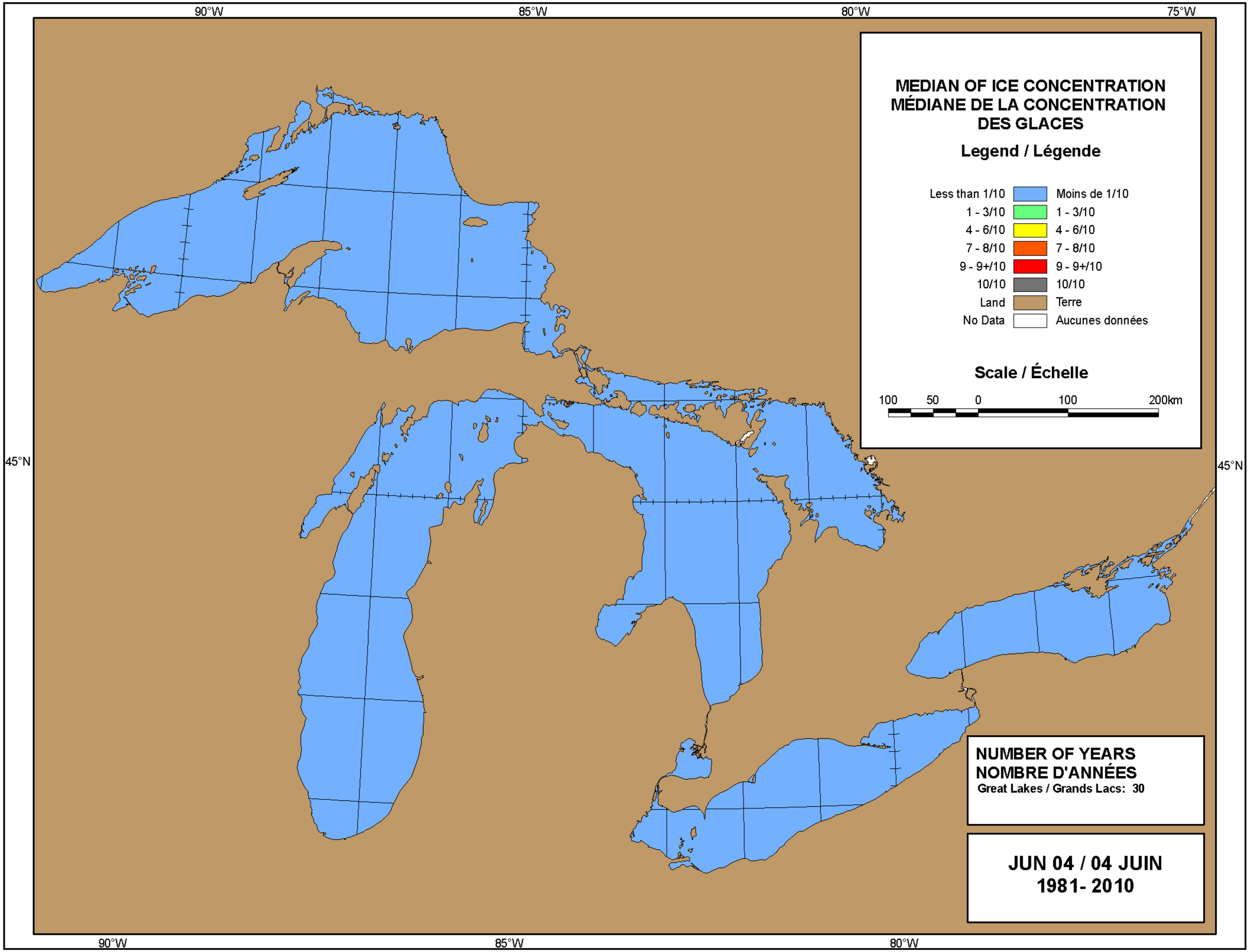


Canada

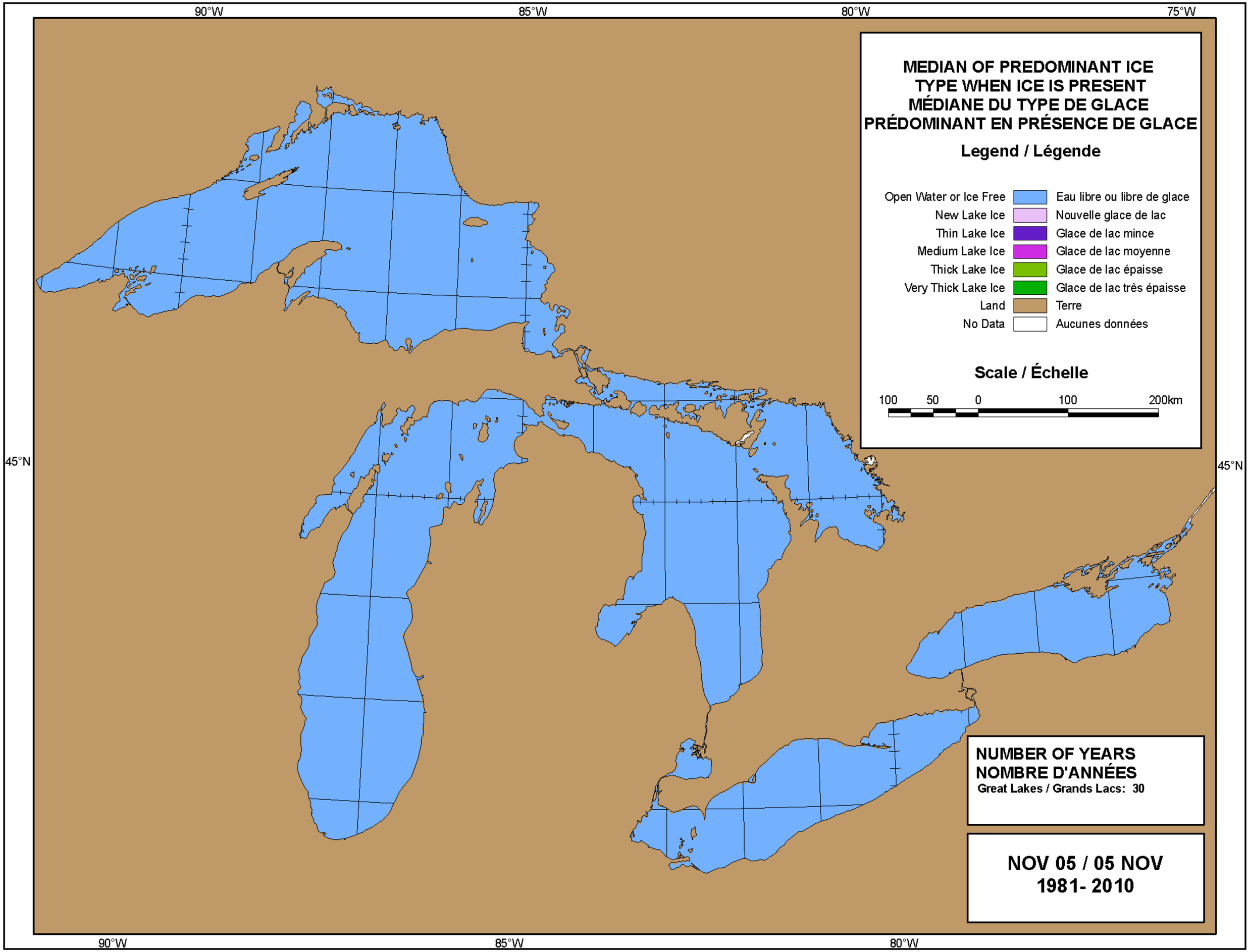
Environment Canada Environnement Canada

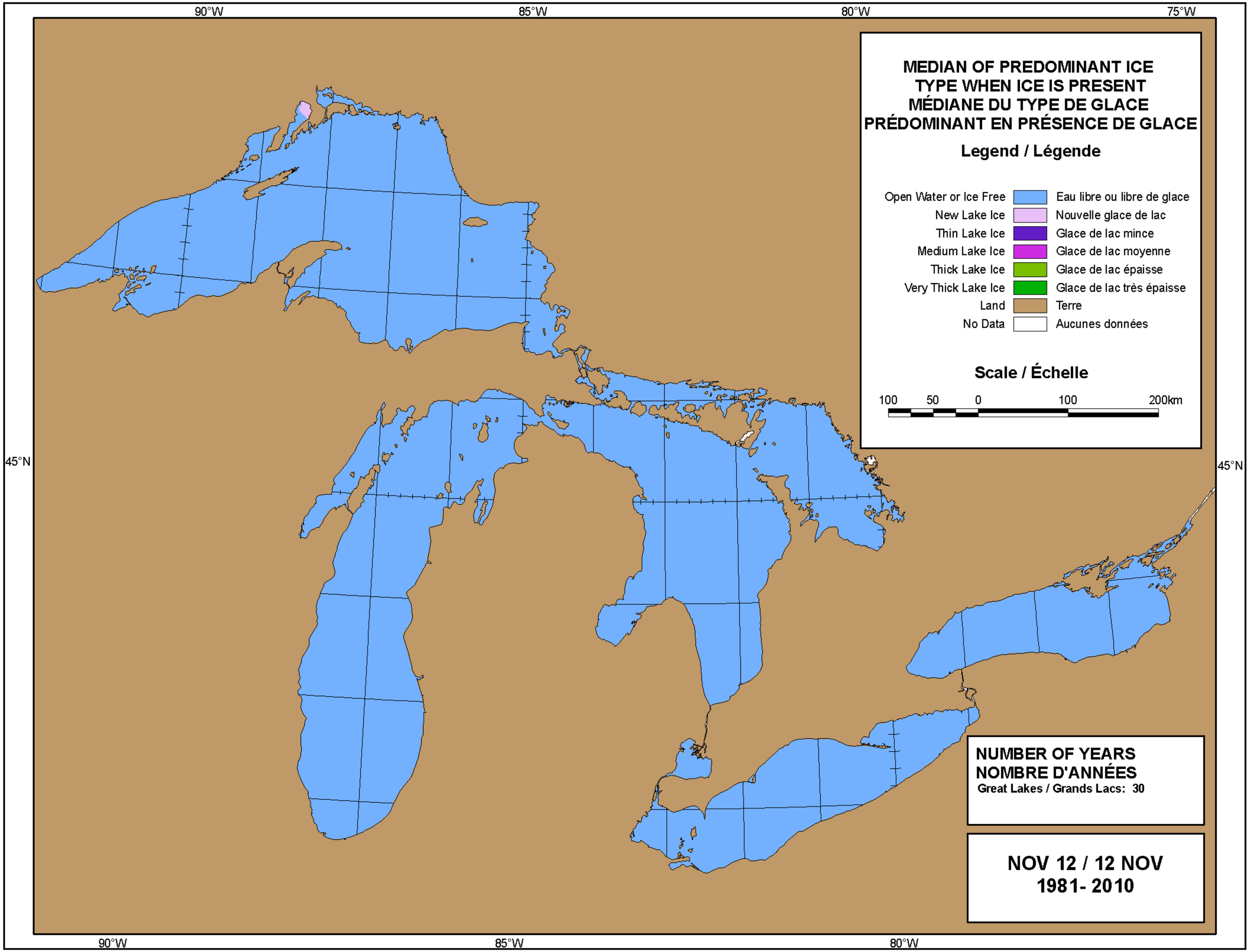


Canada

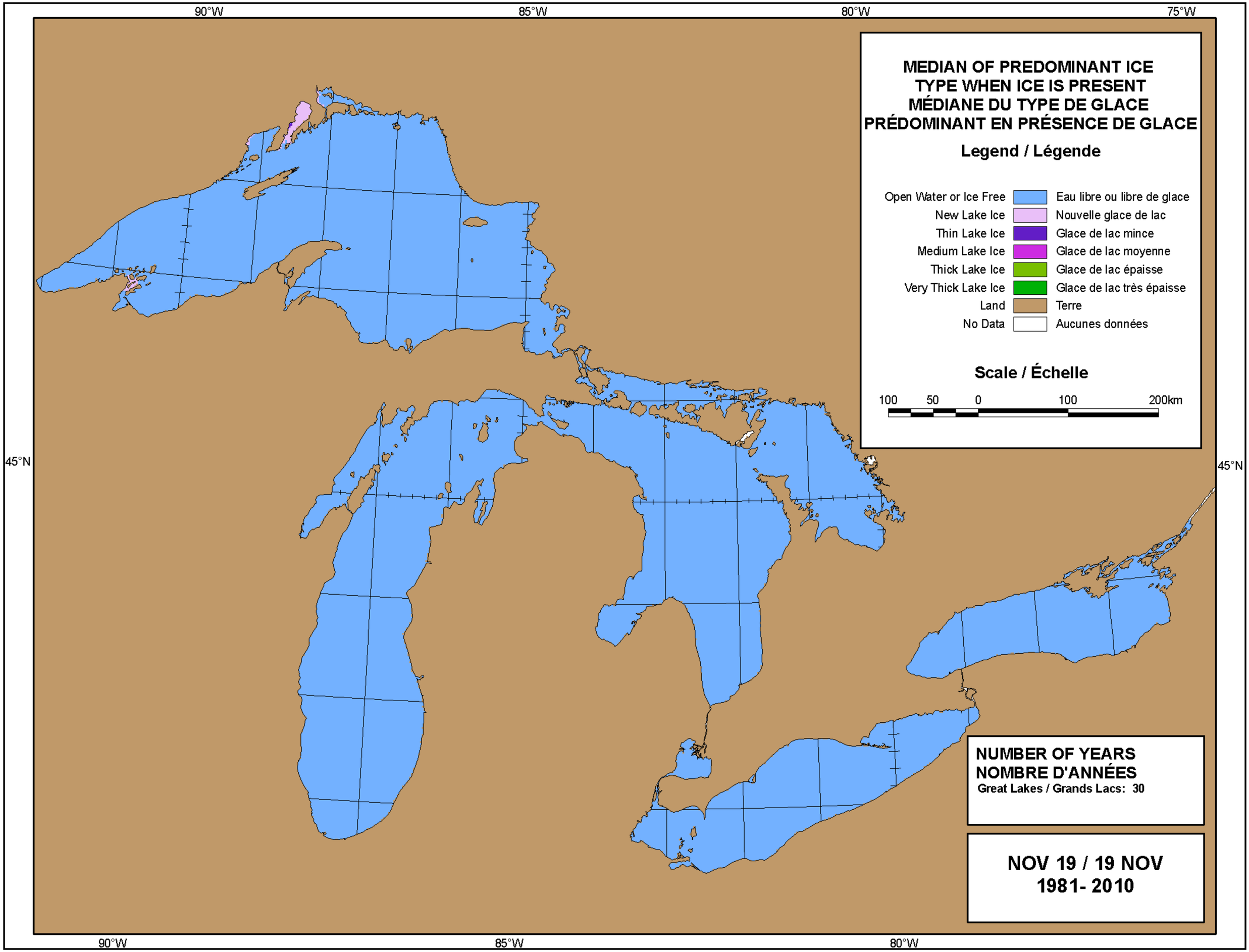

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
MÉDIANE DE LA CONCENTRATION
DES GLACES
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JUN 04 / 04 JUIN
1981- 2010

30-Year Median of Predominant Ice Type When Ice is Present Charts

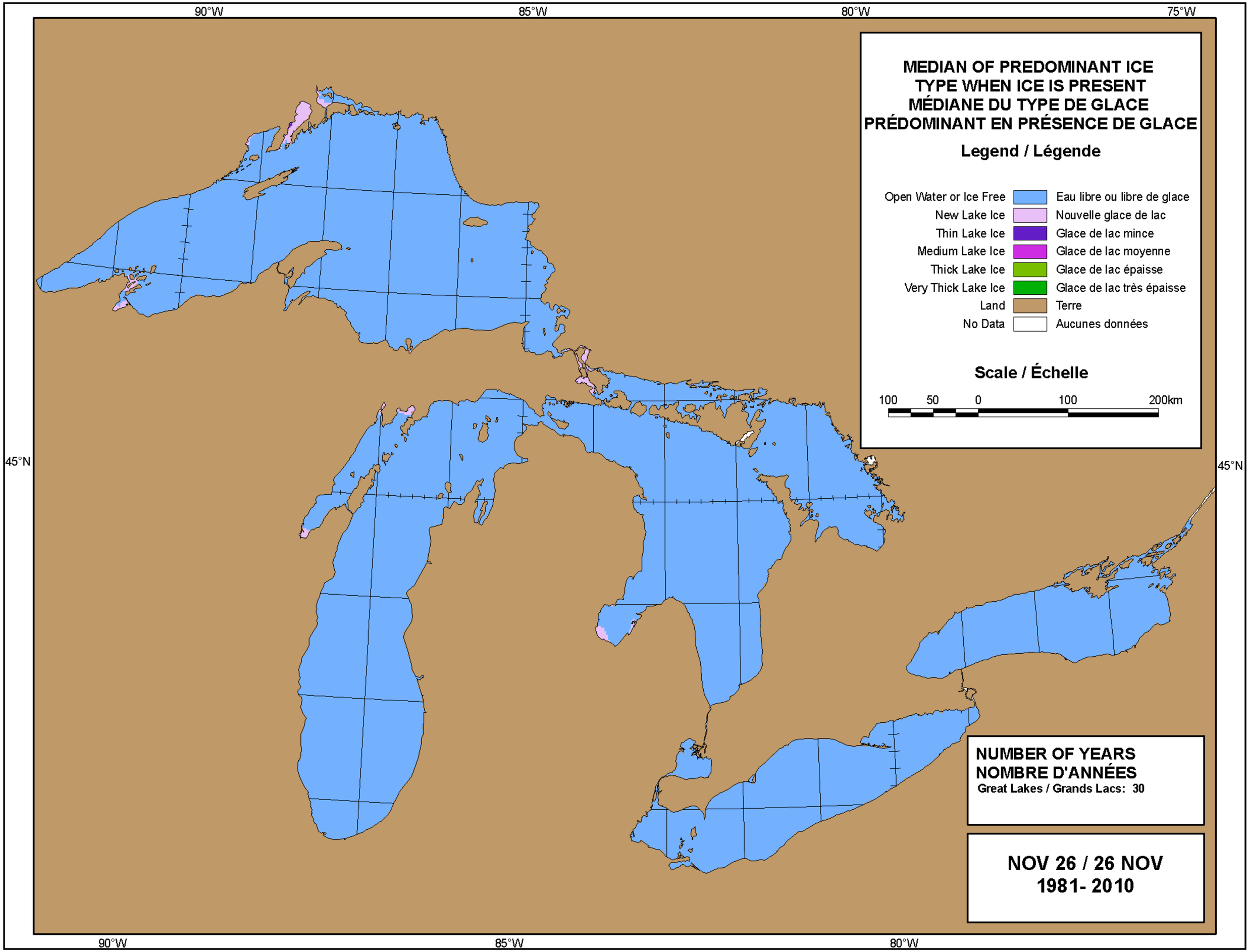

90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 05 / 05 NOV
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 12 / 12 NOV
1981- 2010

Environment Canada Environnement Canada



Canada


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
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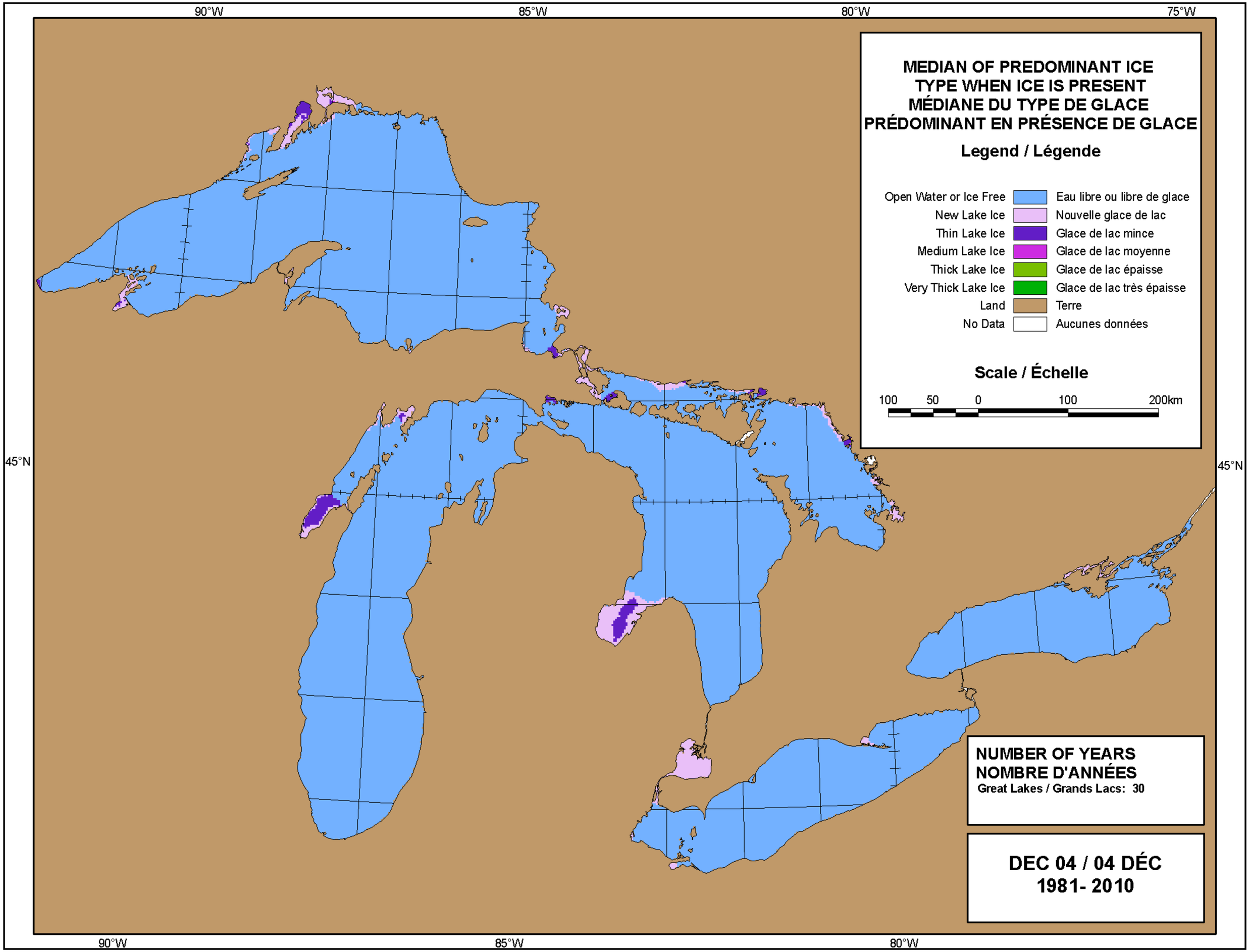
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 26 / 26 NOV
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
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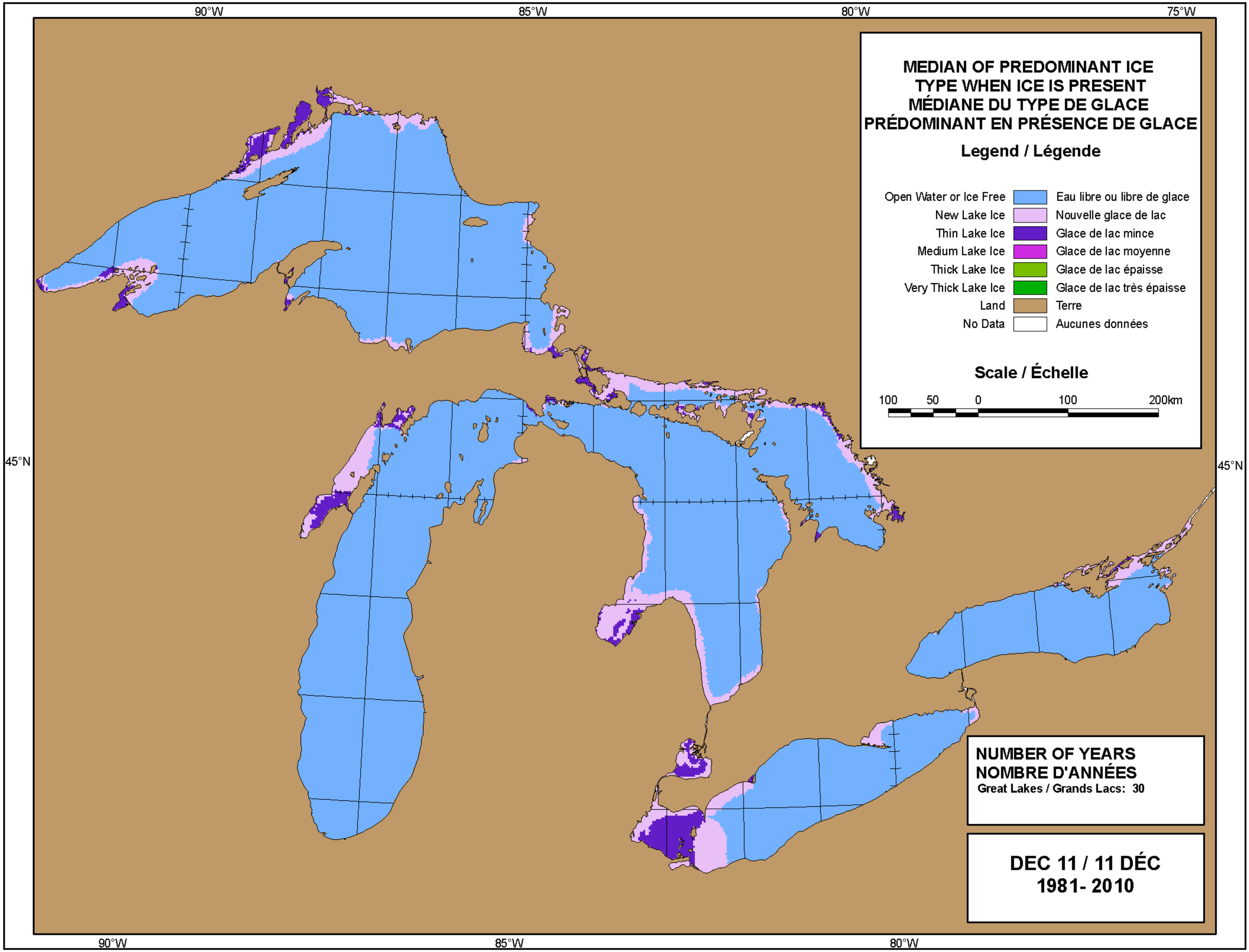
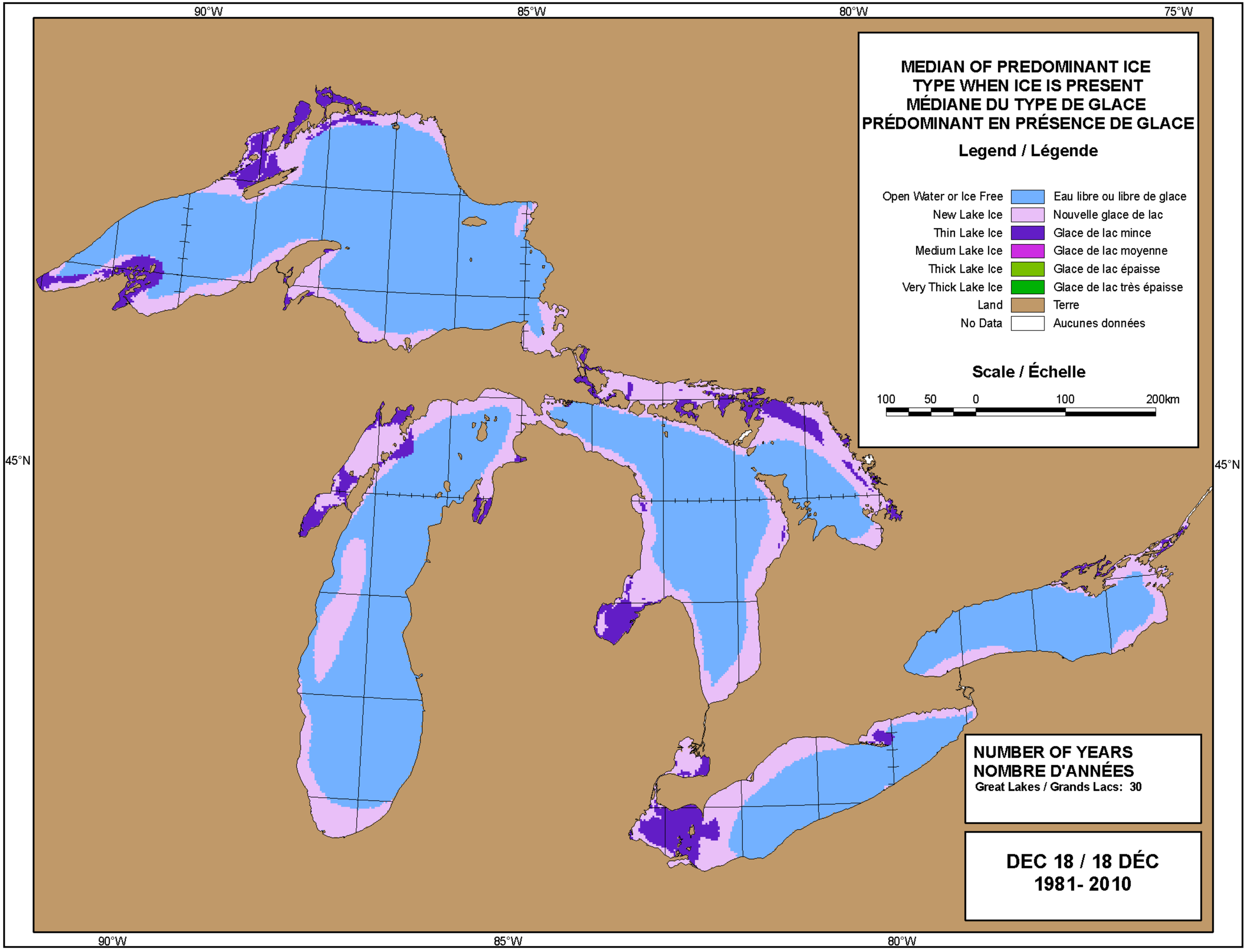
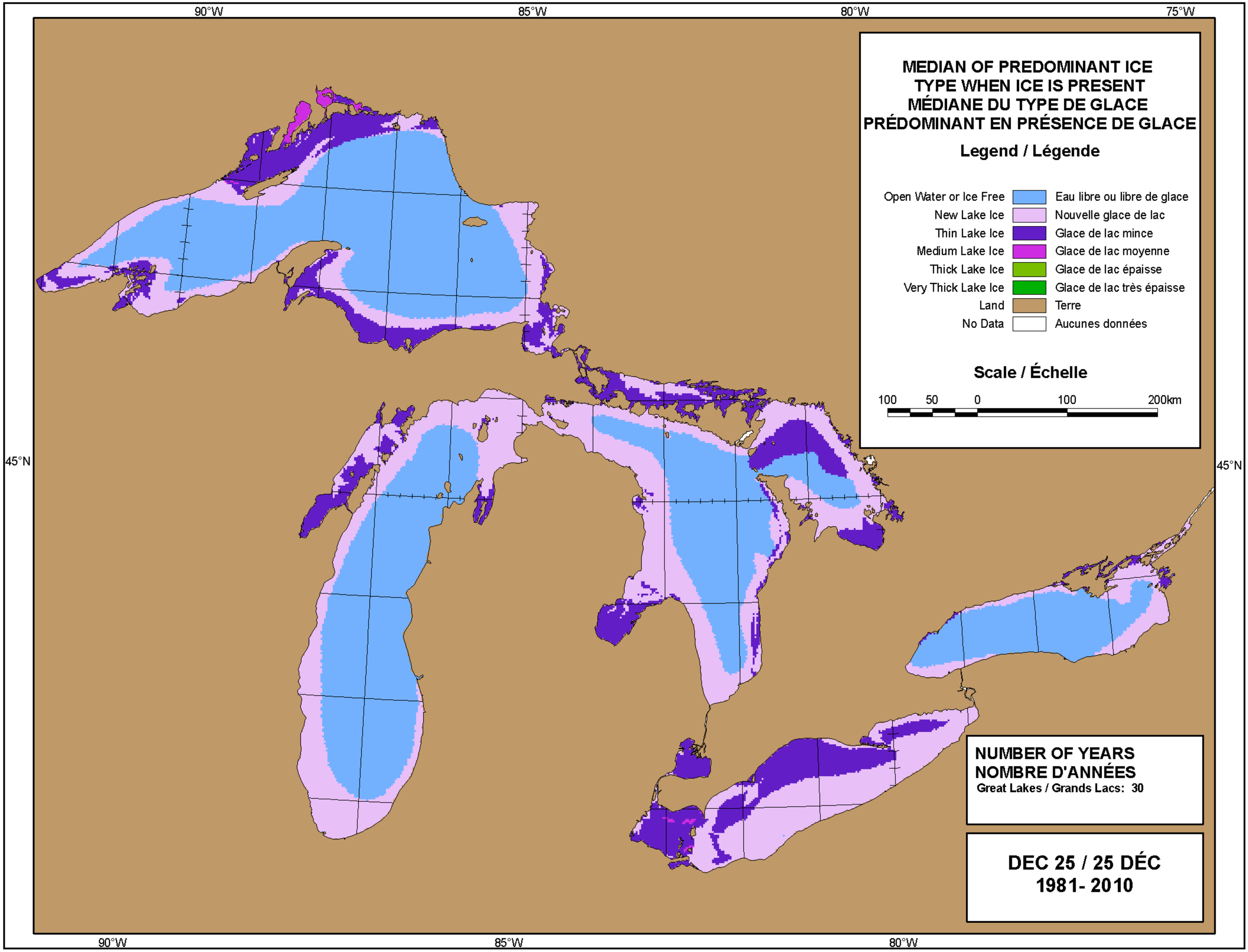
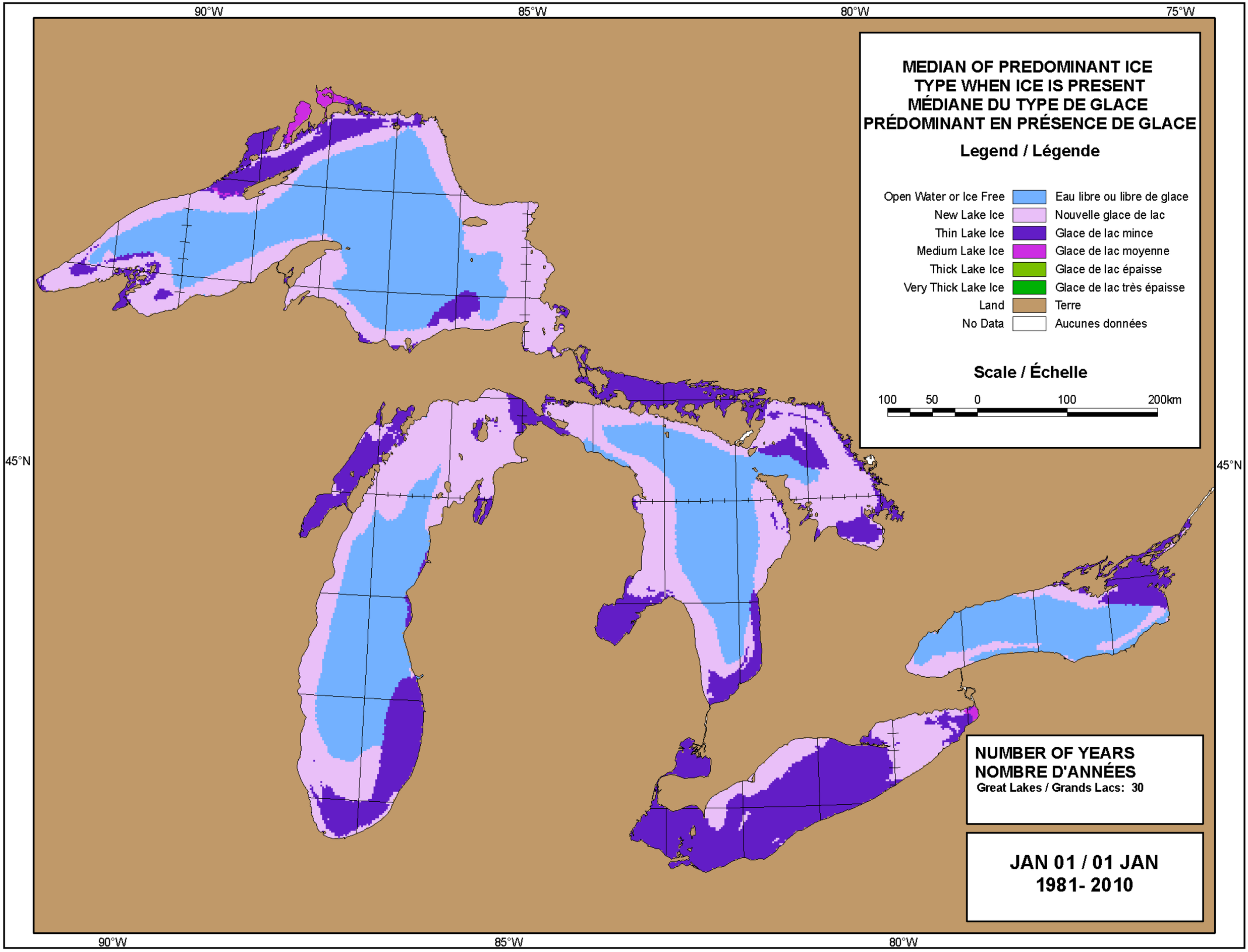
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 04 / 04 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 11 / 11 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 18 / 18 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 25 / 25 DÉC
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
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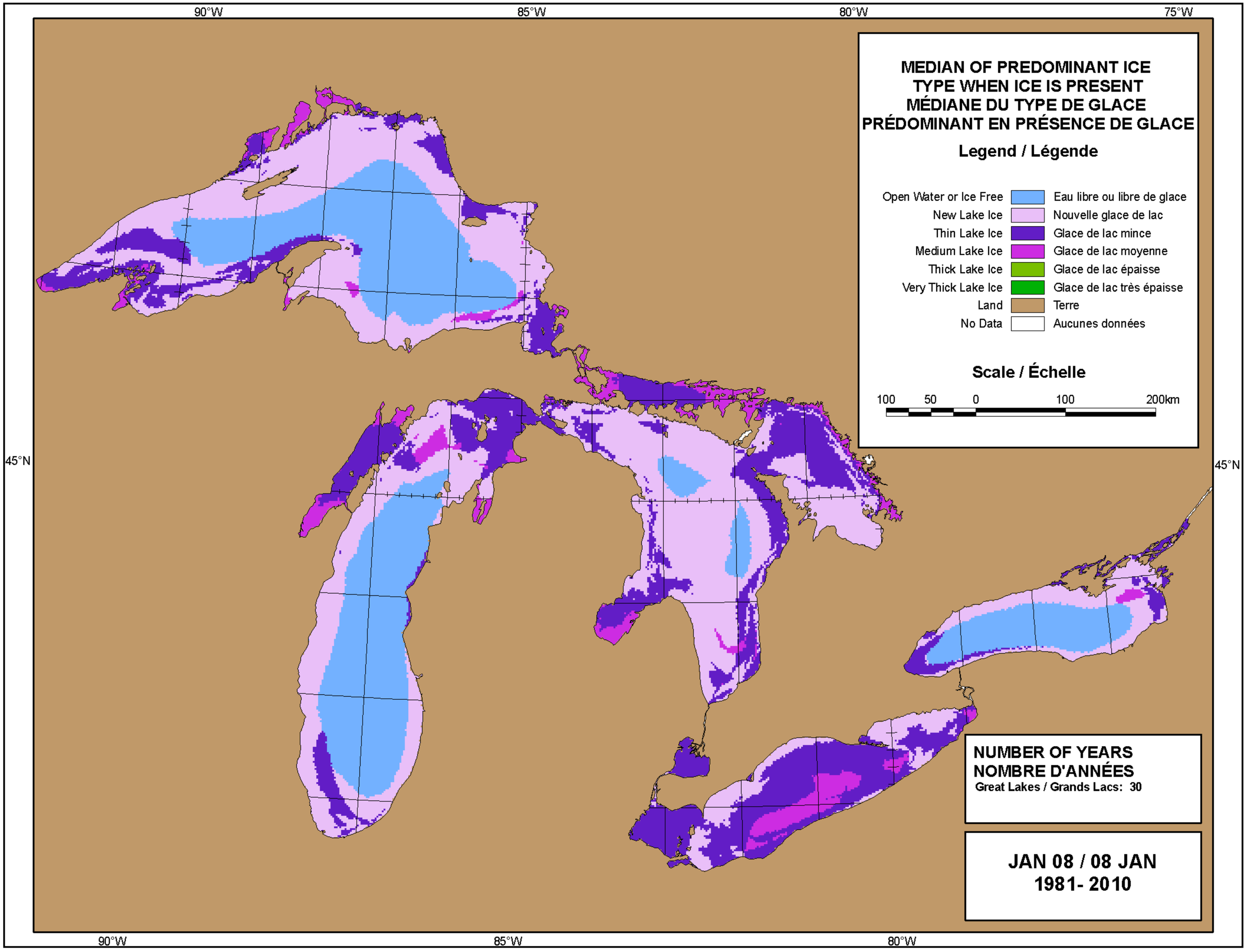
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 01 / 01 JAN
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
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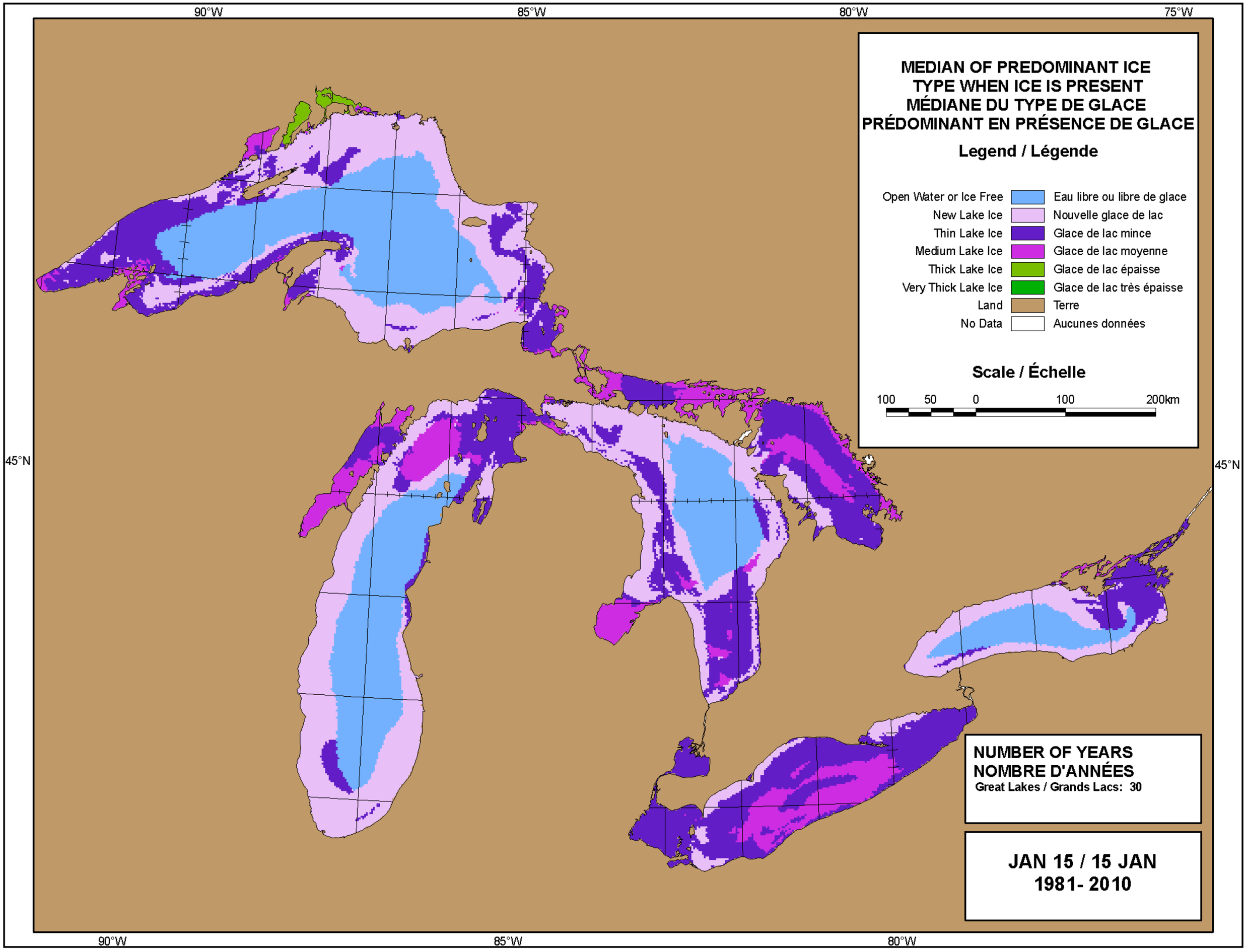
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 08 / 08 JAN
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
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Open Water or Ice Free
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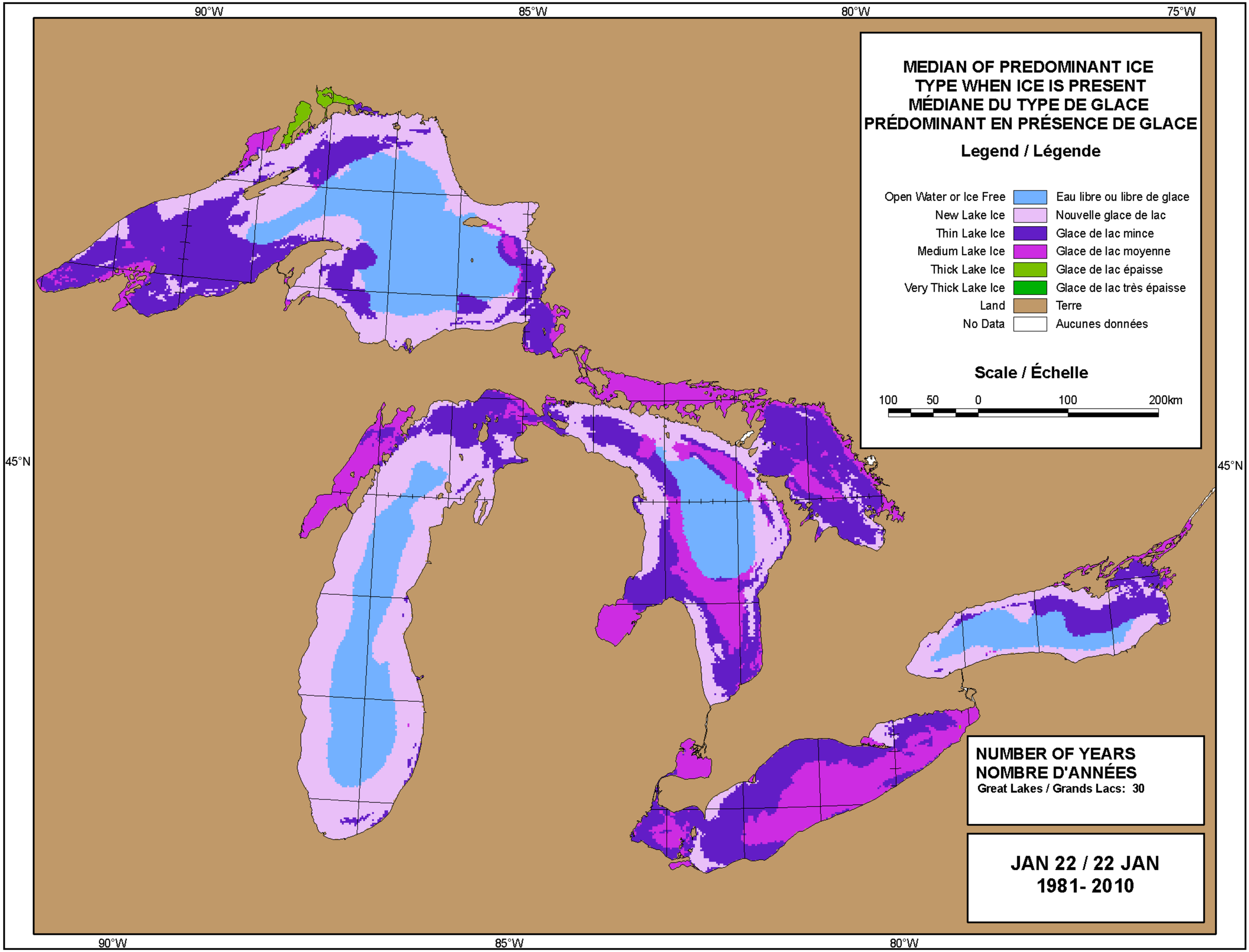
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 15 / 15 JAN
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
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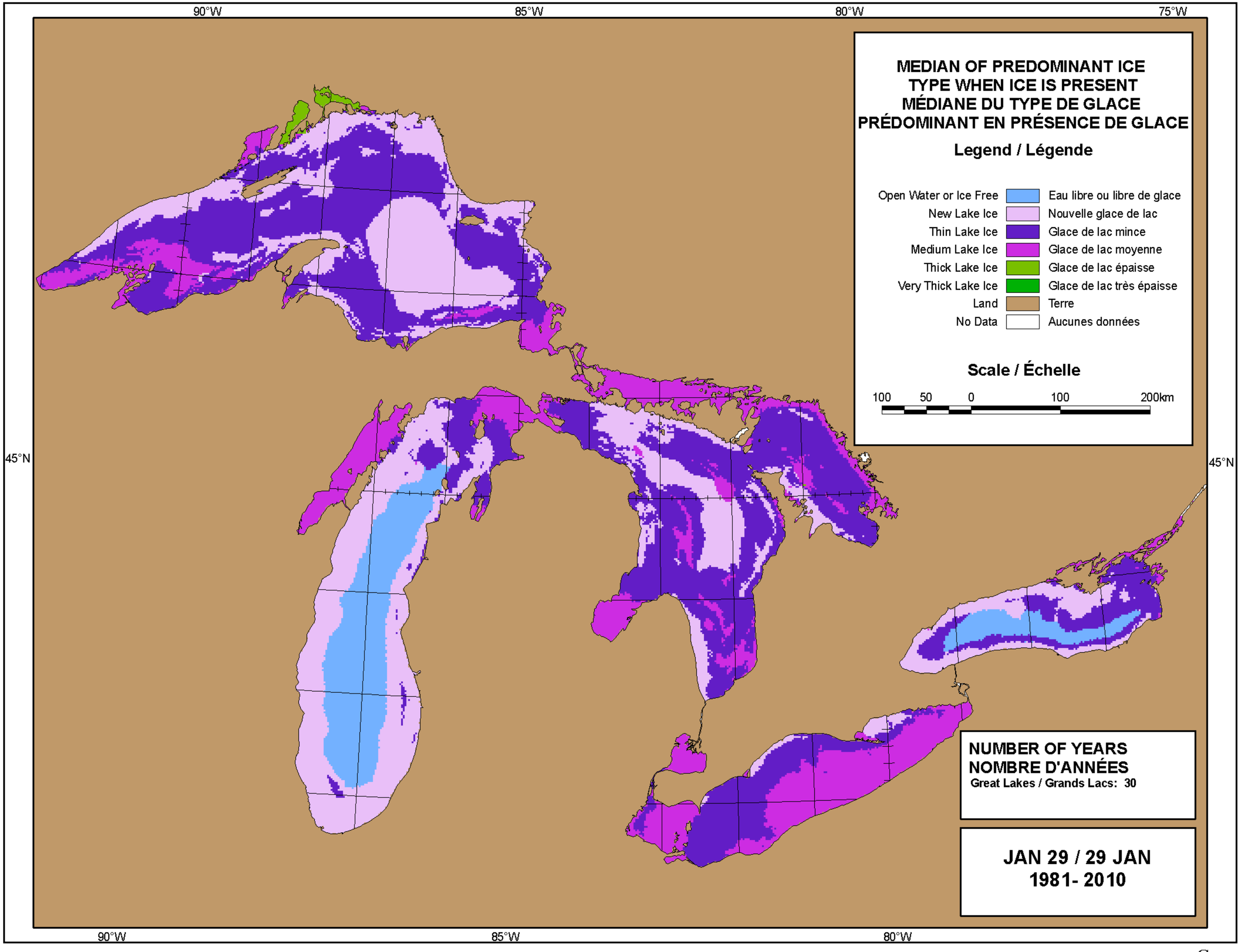
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 22 / 22 JAN
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
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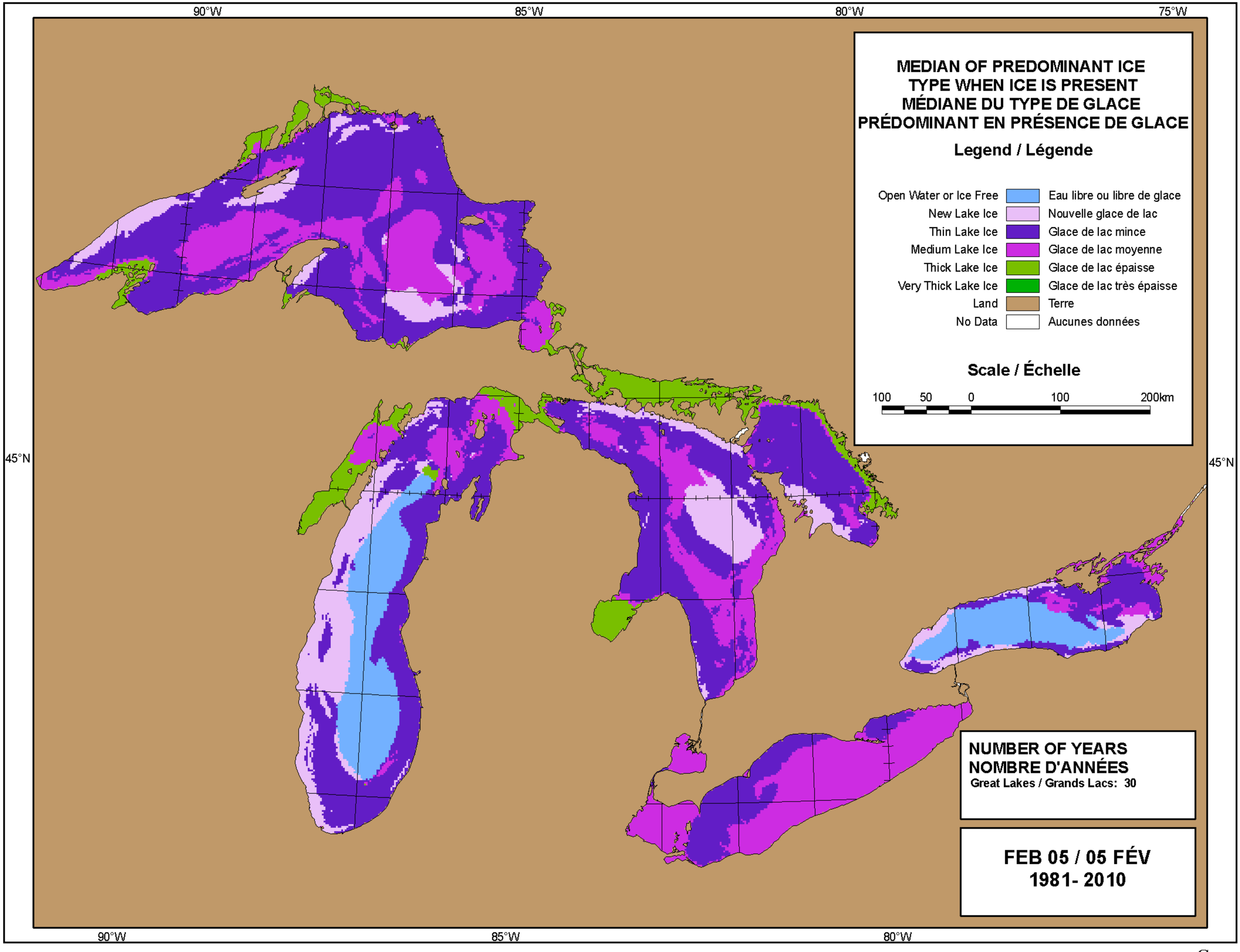
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 29 / 29 JAN
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
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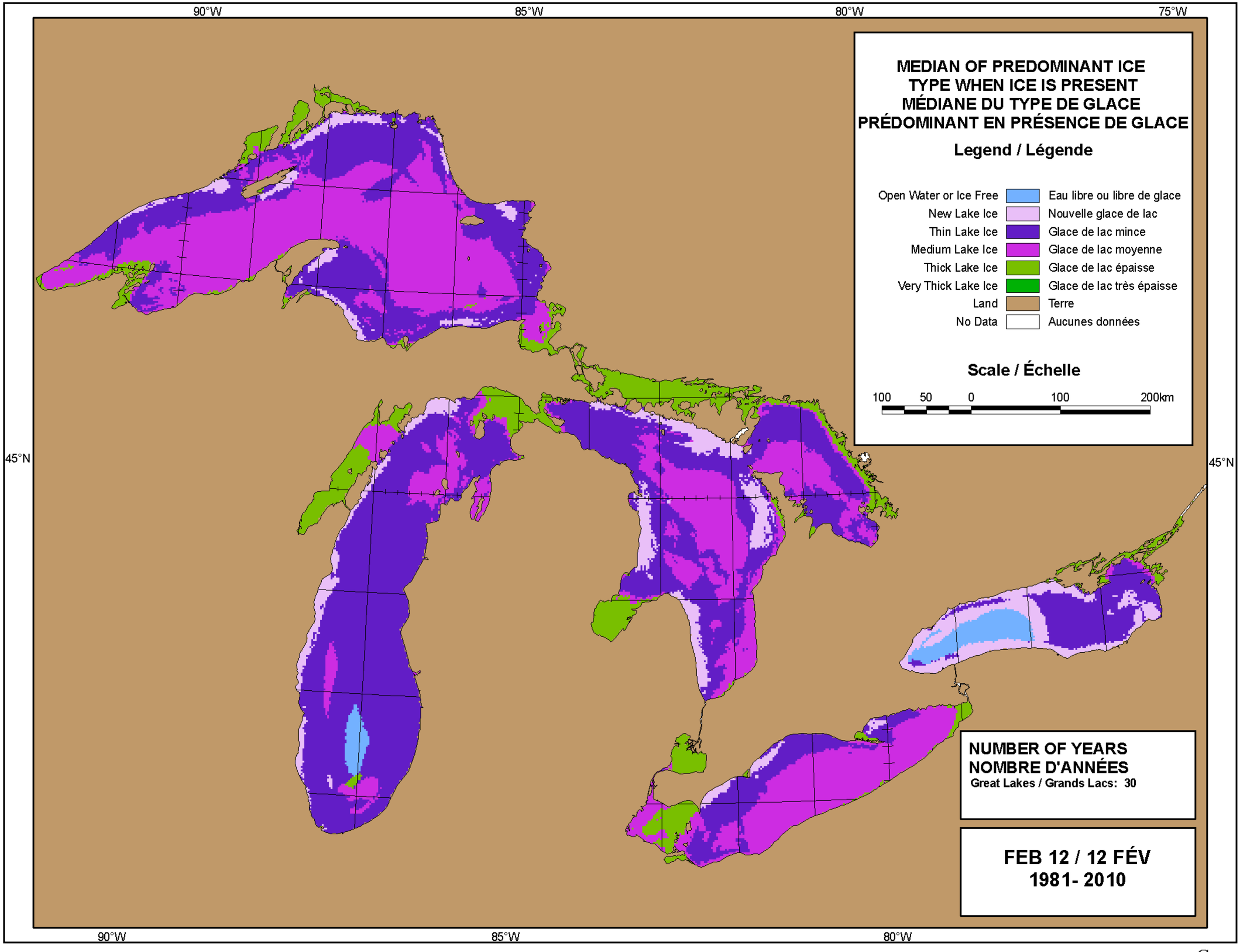
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 05 / 05 FÉV
1981- 2010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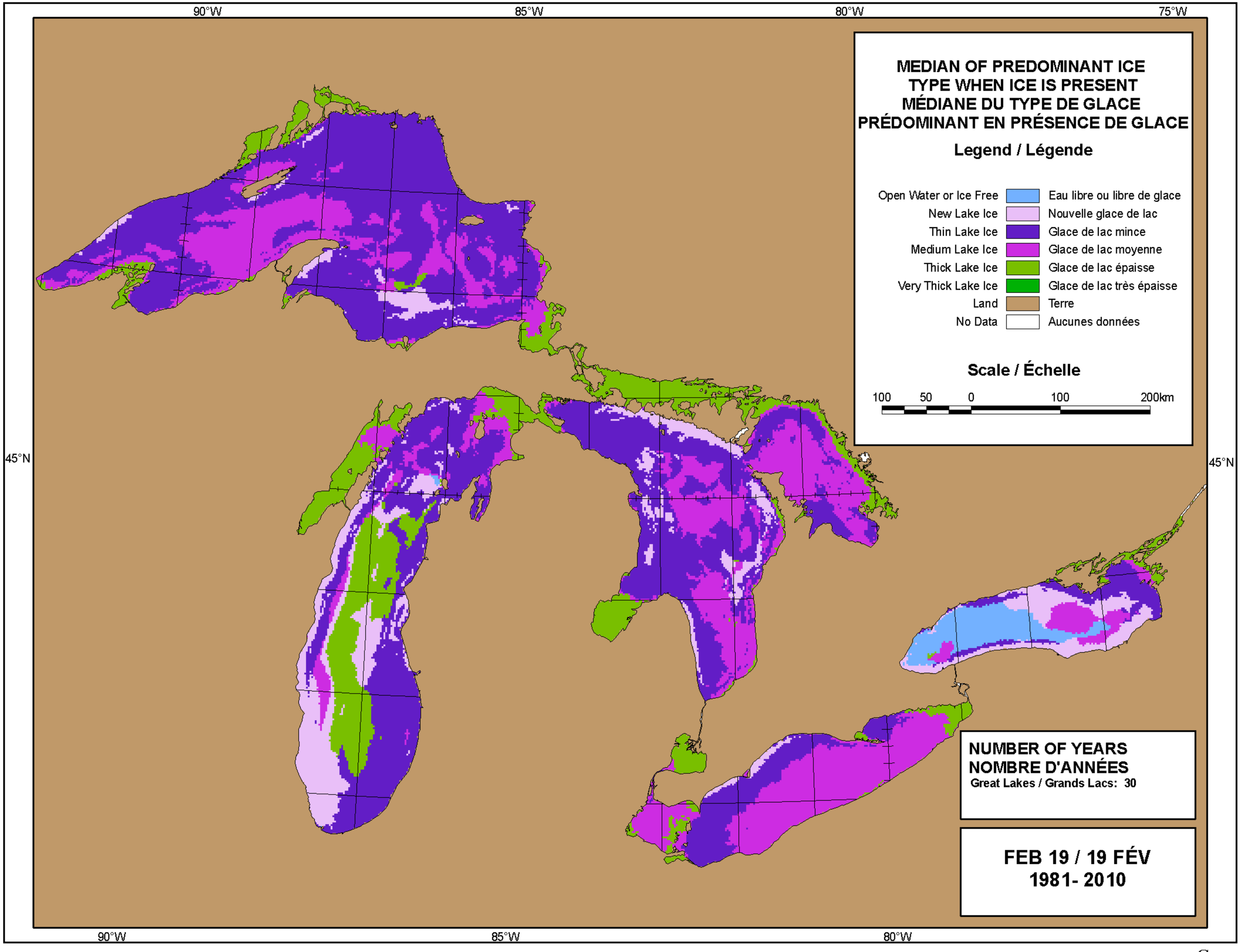
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 12 / 12 FÉV
1981- 2010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Terre
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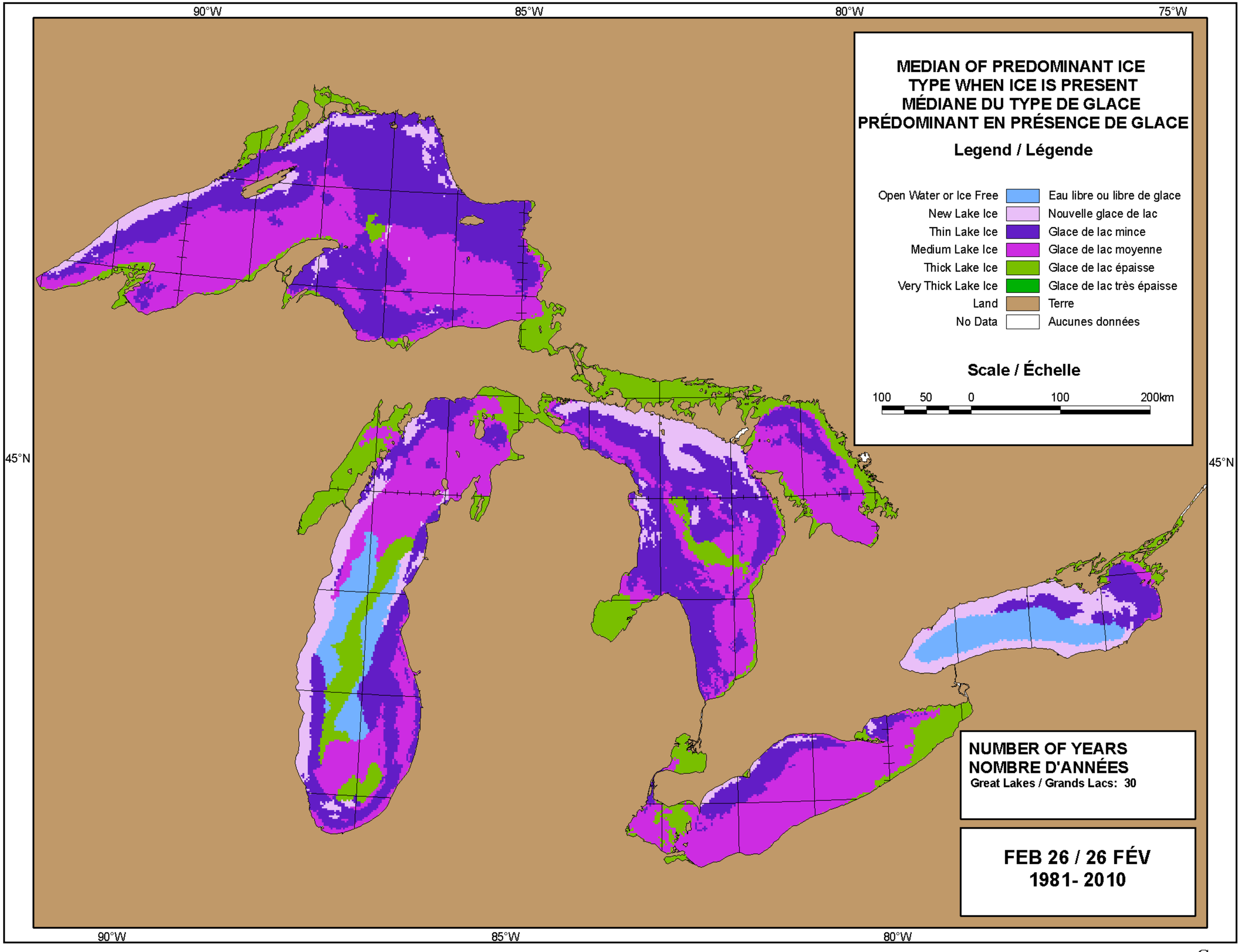
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 19 / 19 FÉV
1981- 2010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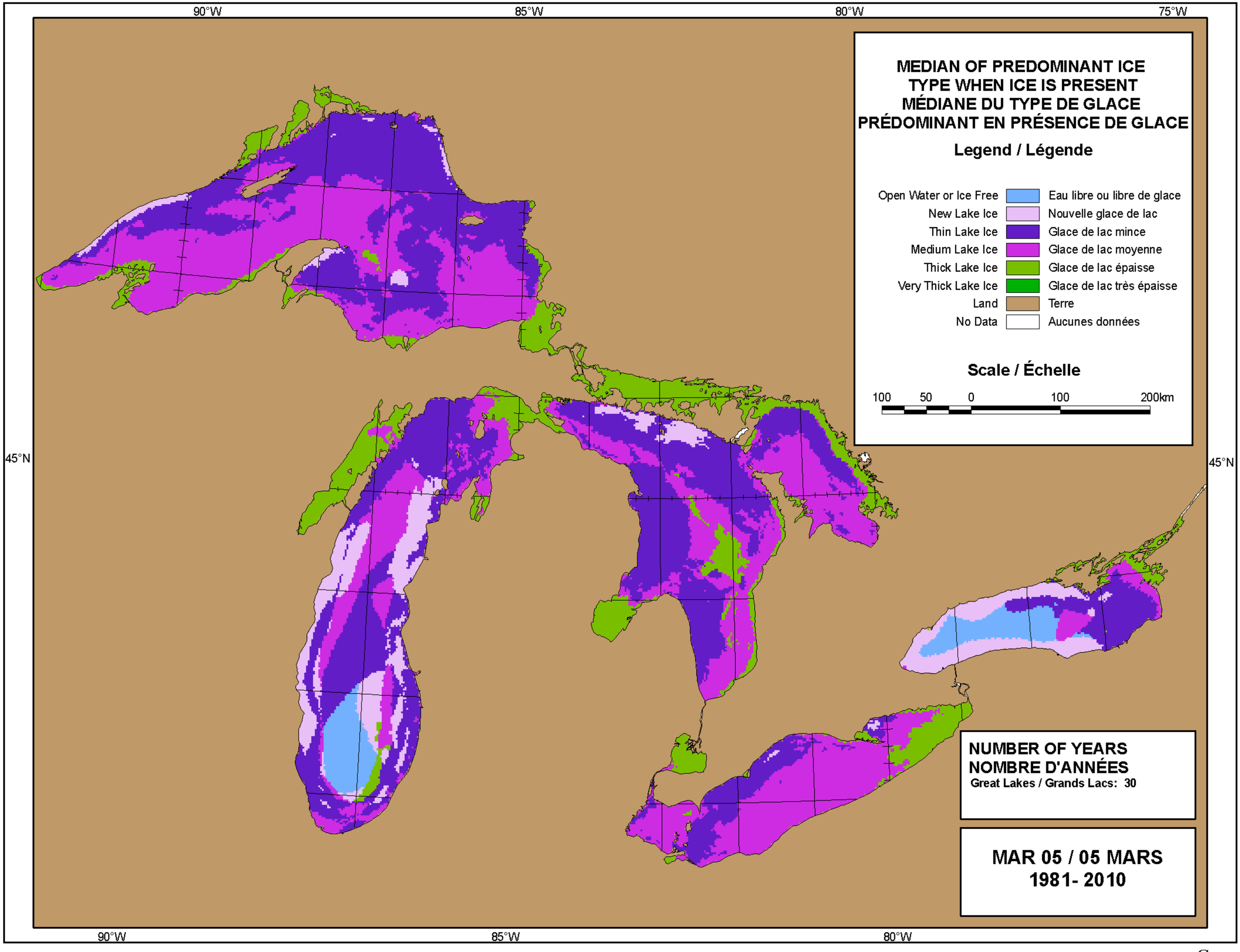
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 26 / 26 FÉV
1981- 2010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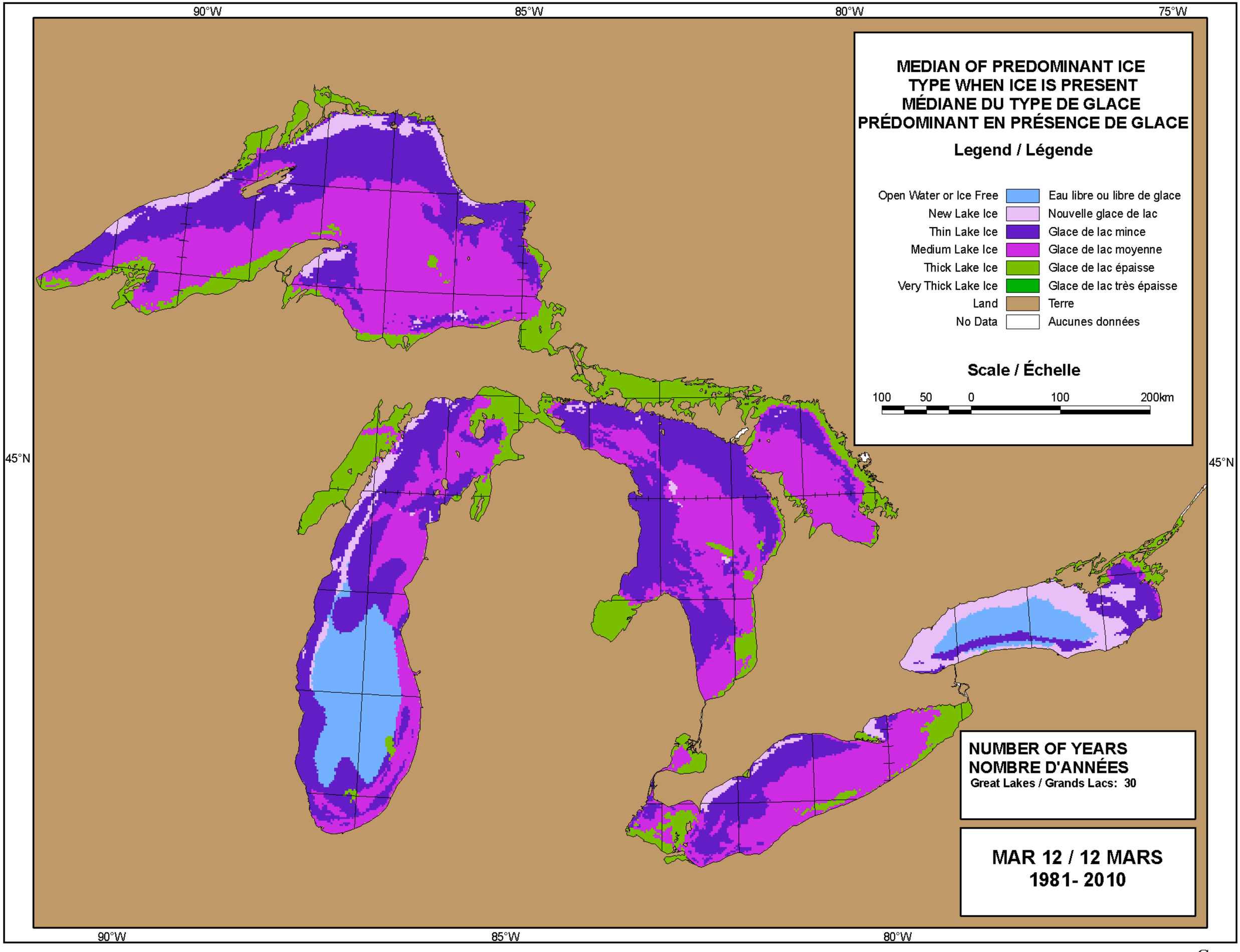
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 05 / 05 MARS
1981- 2010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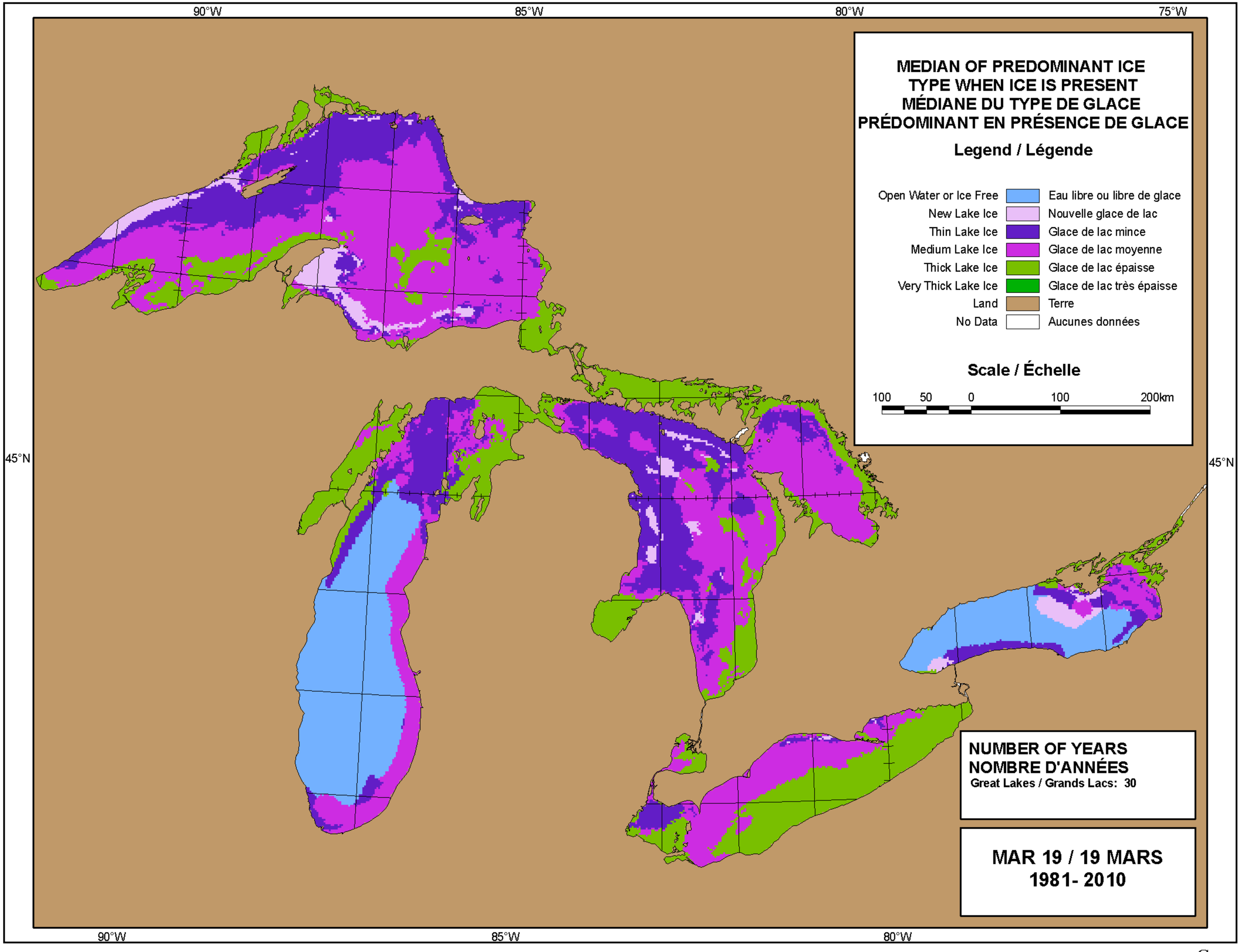
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 12 / 12 MARS
1981- 2010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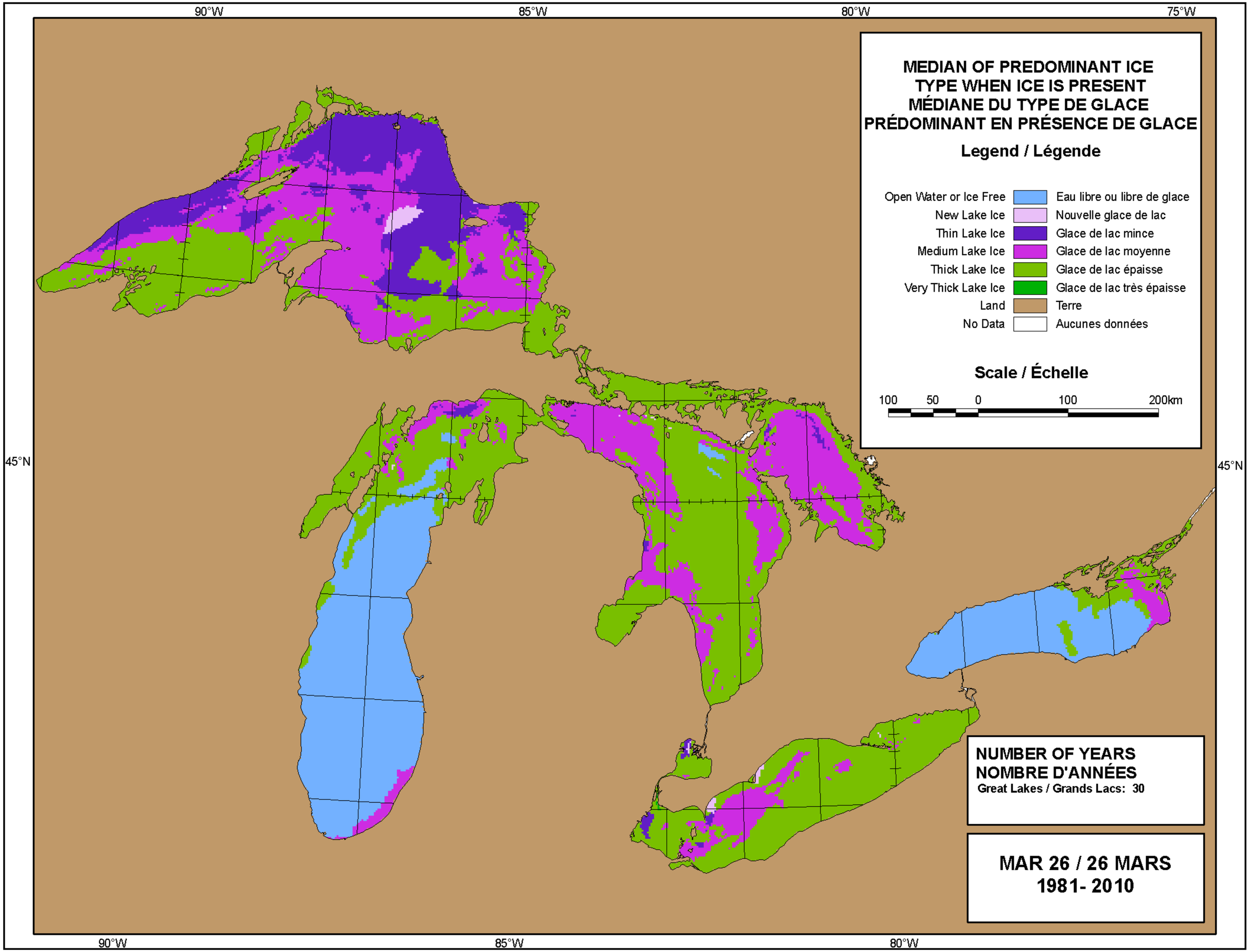
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 19 / 19 MARS
1981- 2010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Scale / Échelle
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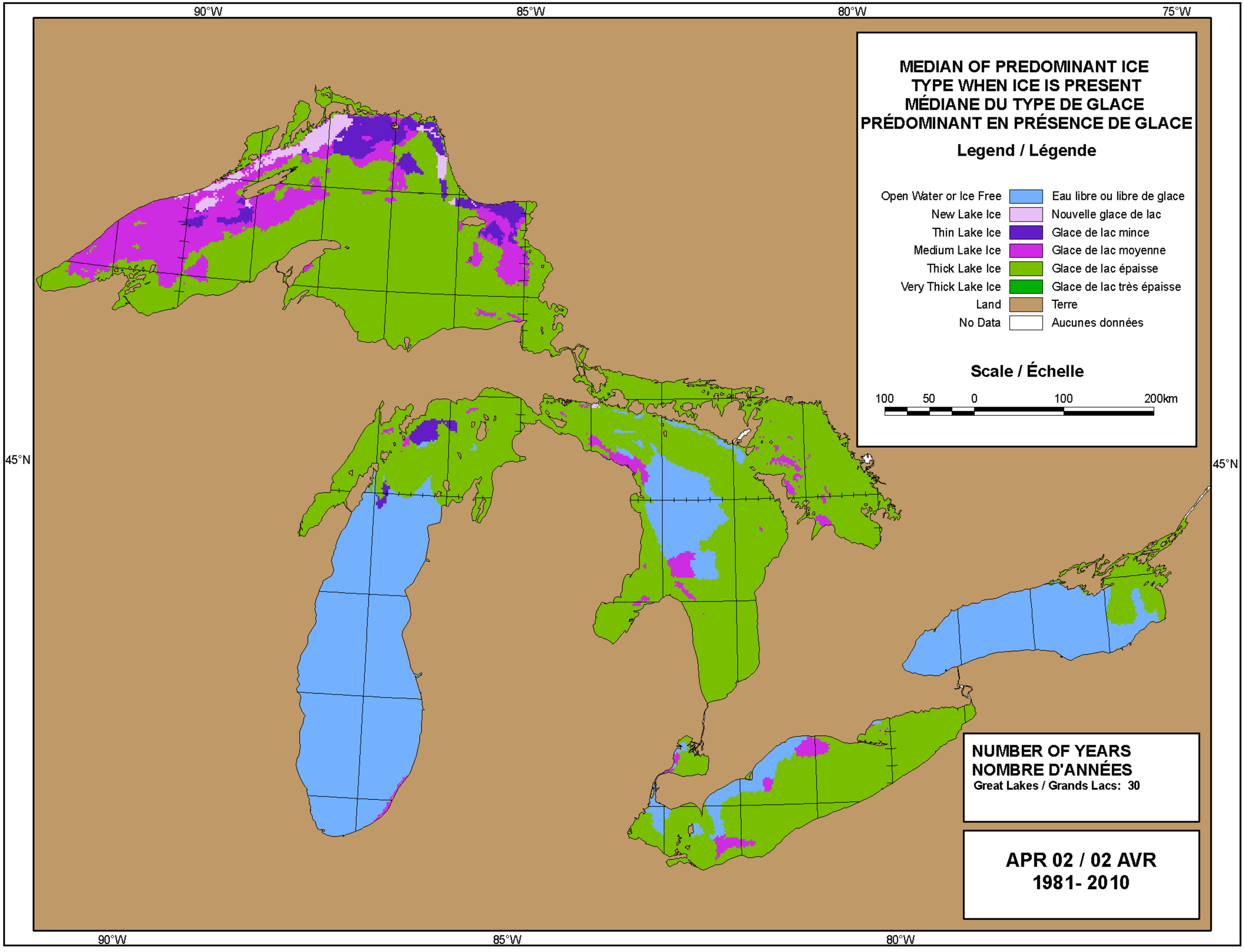
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 26 / 26 MARS
1981- 2010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Land
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No Data
Aucunes données
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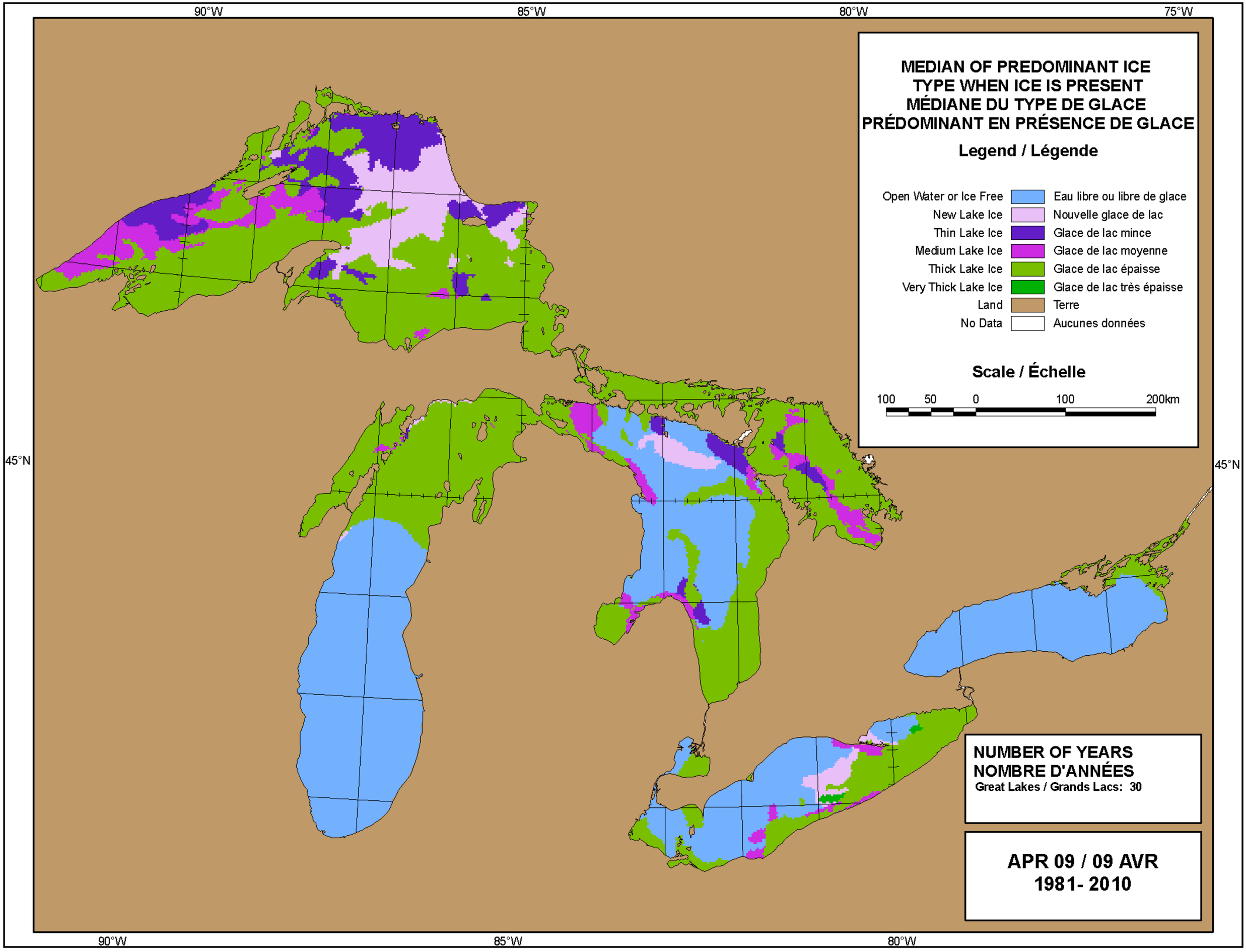
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 02 / 02 AVR
1981- 2010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Aucunes données
Scale / Échelle
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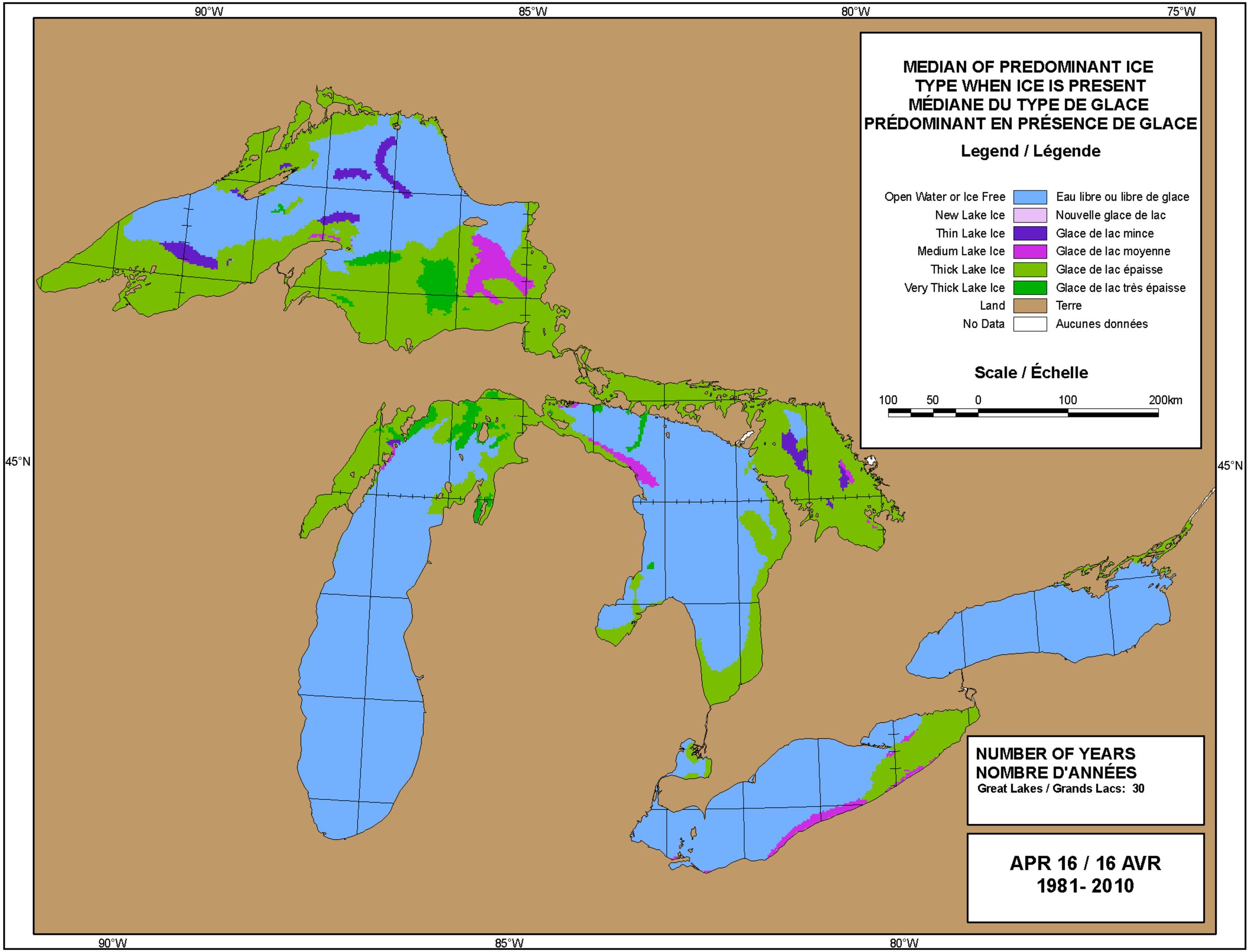
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 09 / 09 AVR
1981- 2010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MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
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Land
Terre
No Data
Aucunes données
Scale / Échelle
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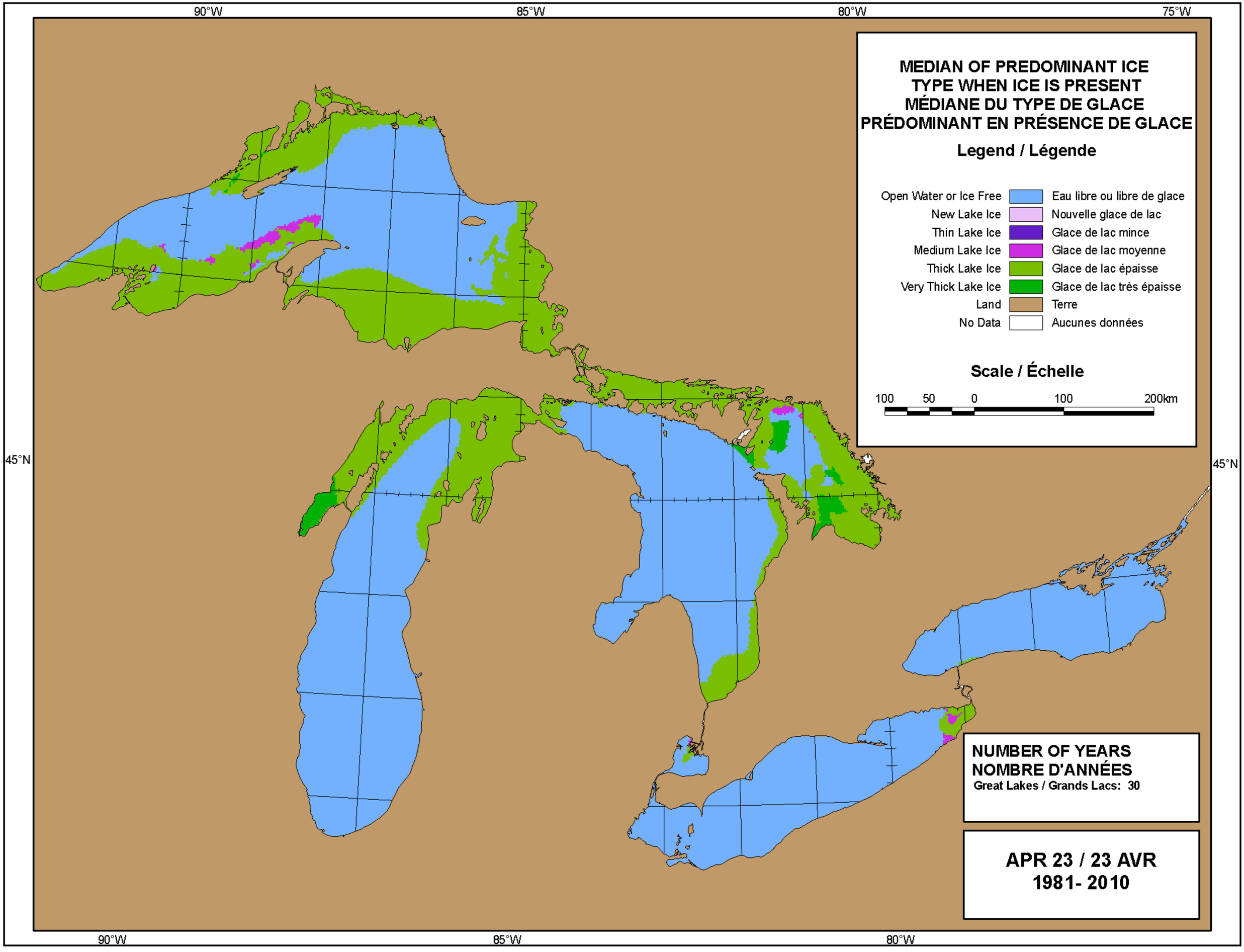
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 16 / 16 AVR
1981- 2010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Terre
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Aucunes données
Scale / Échelle
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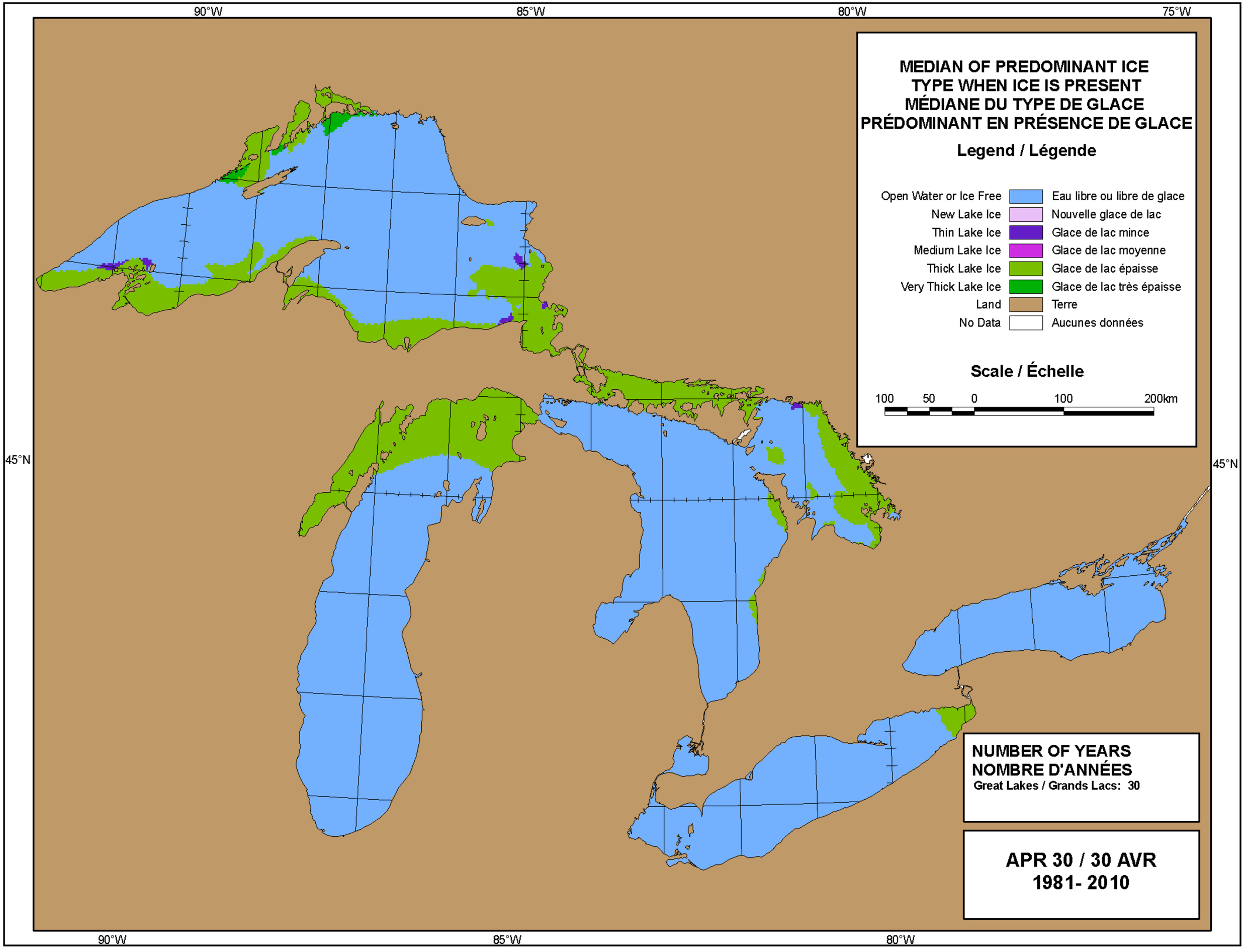
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 23 / 23 AVR
1981- 2010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Terre
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Aucunes données
Scale / Échelle
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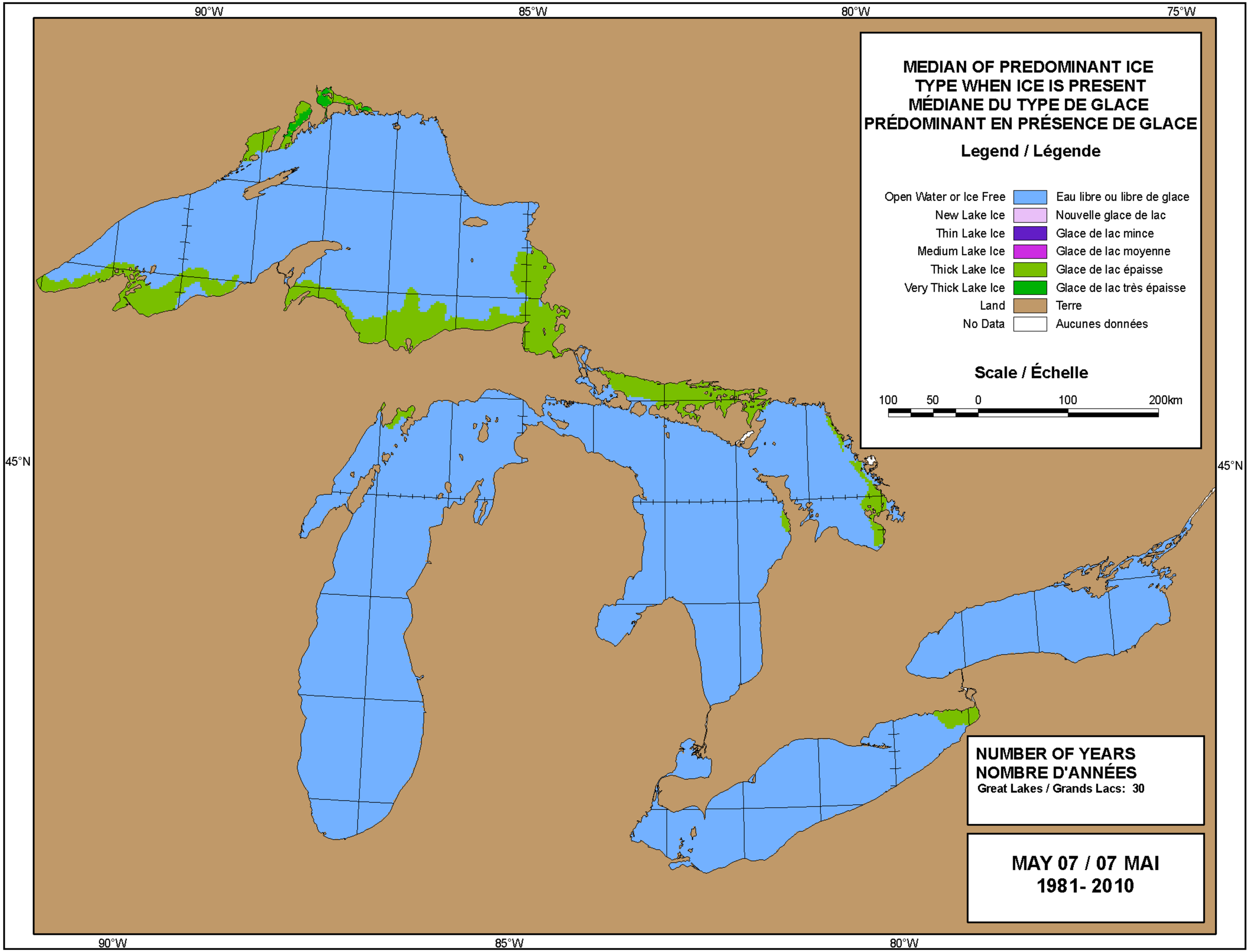
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 30 / 30 AVR
1981- 2010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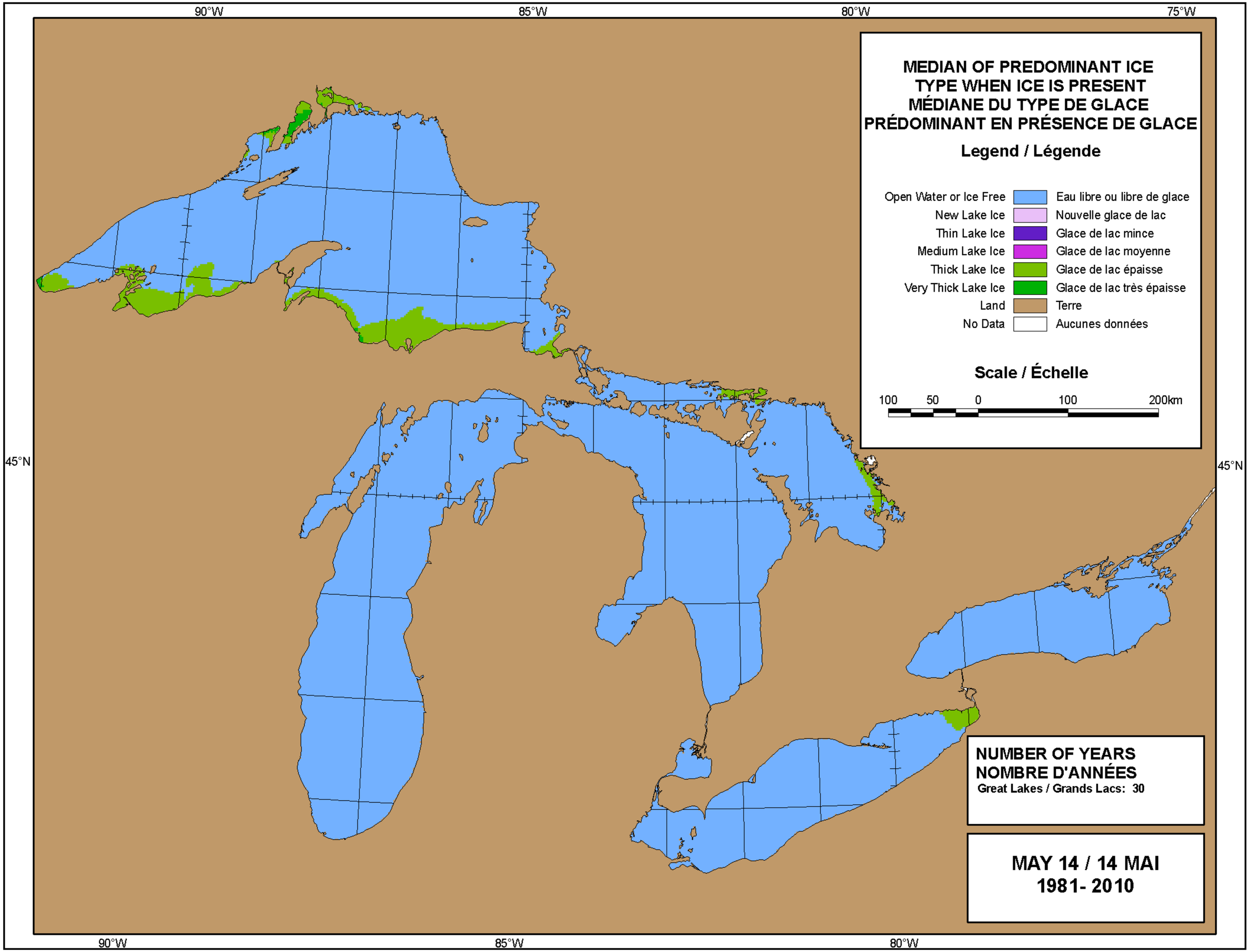
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 07 / 07 MAI
1981- 2010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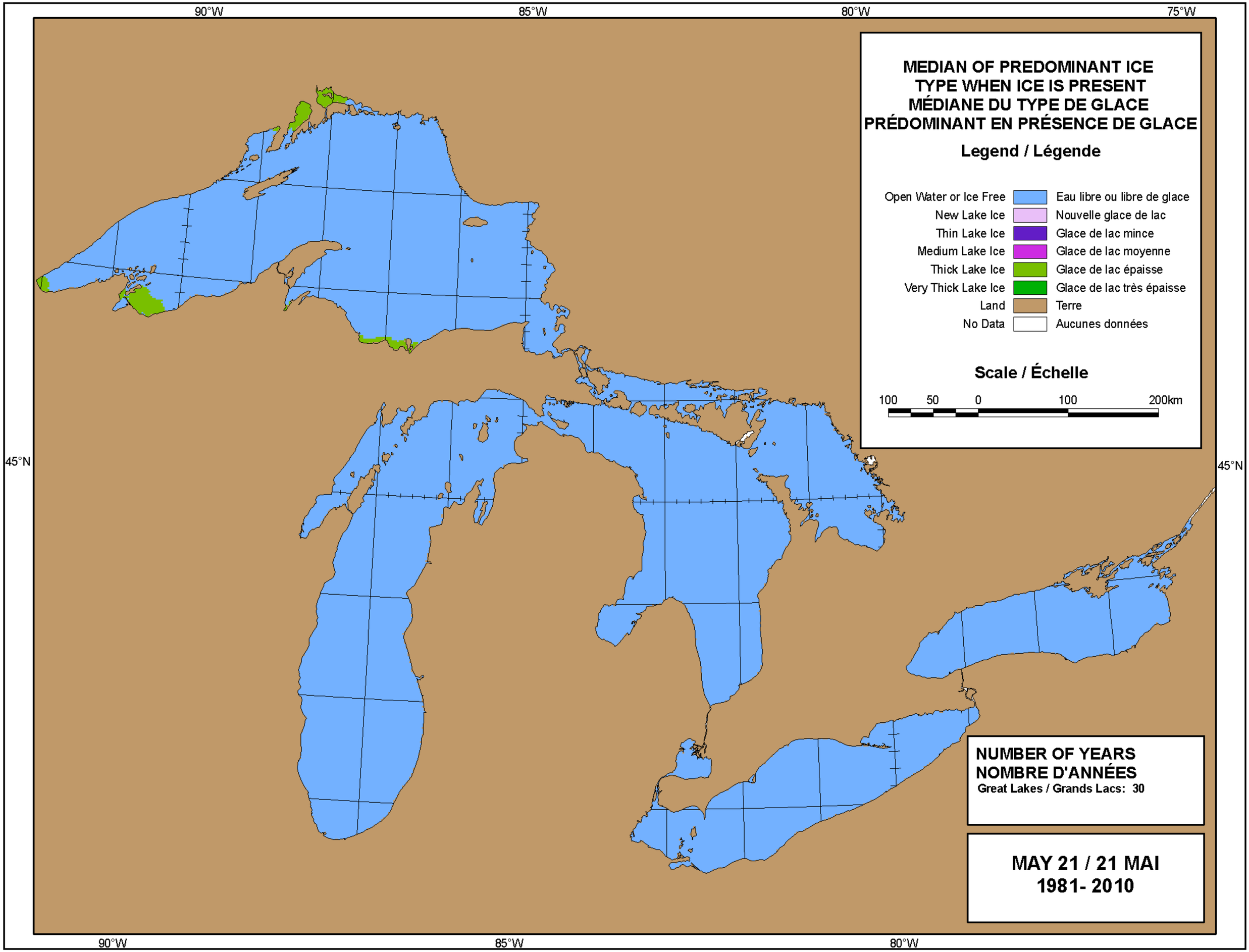
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 14 / 14 MAI
1981- 2010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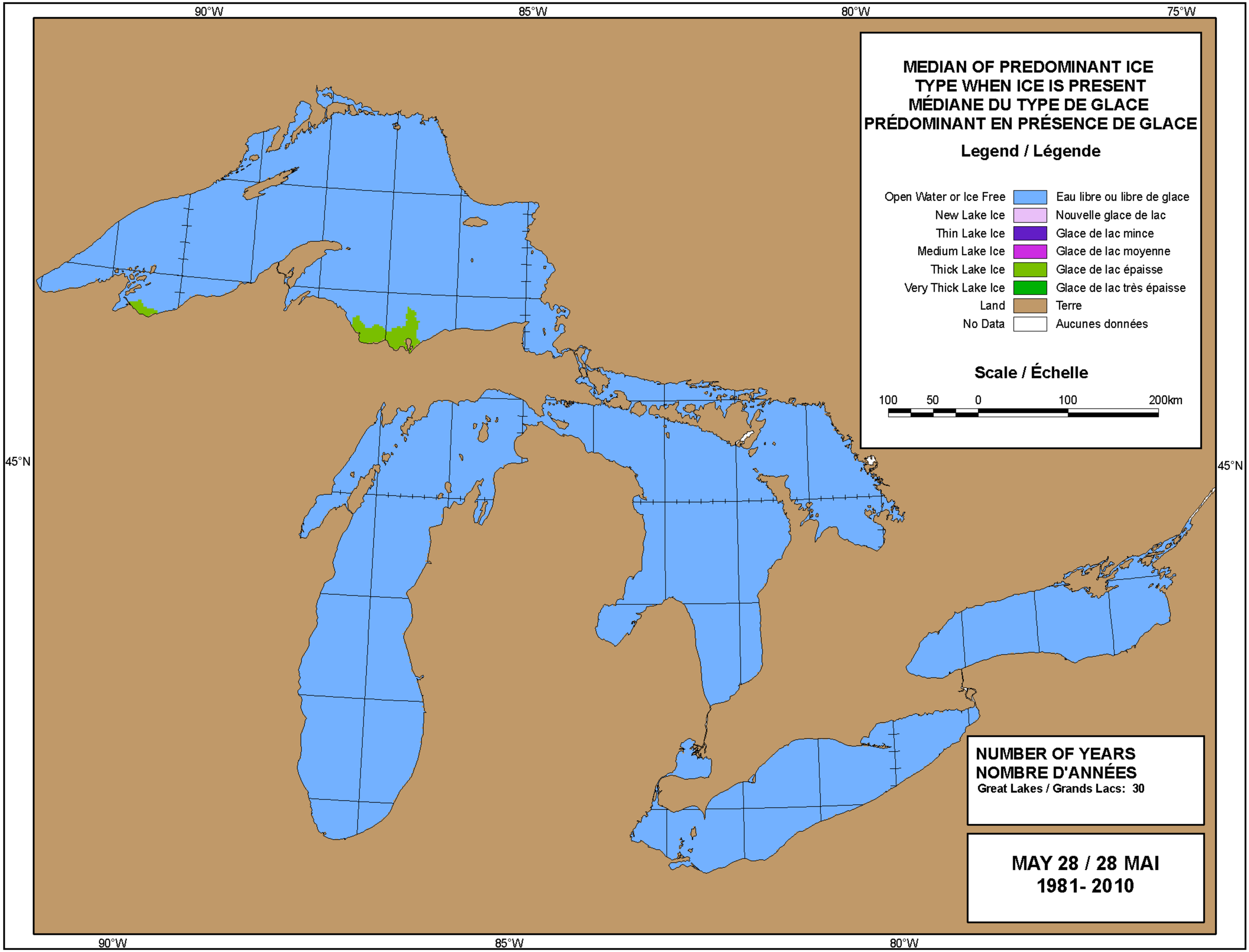
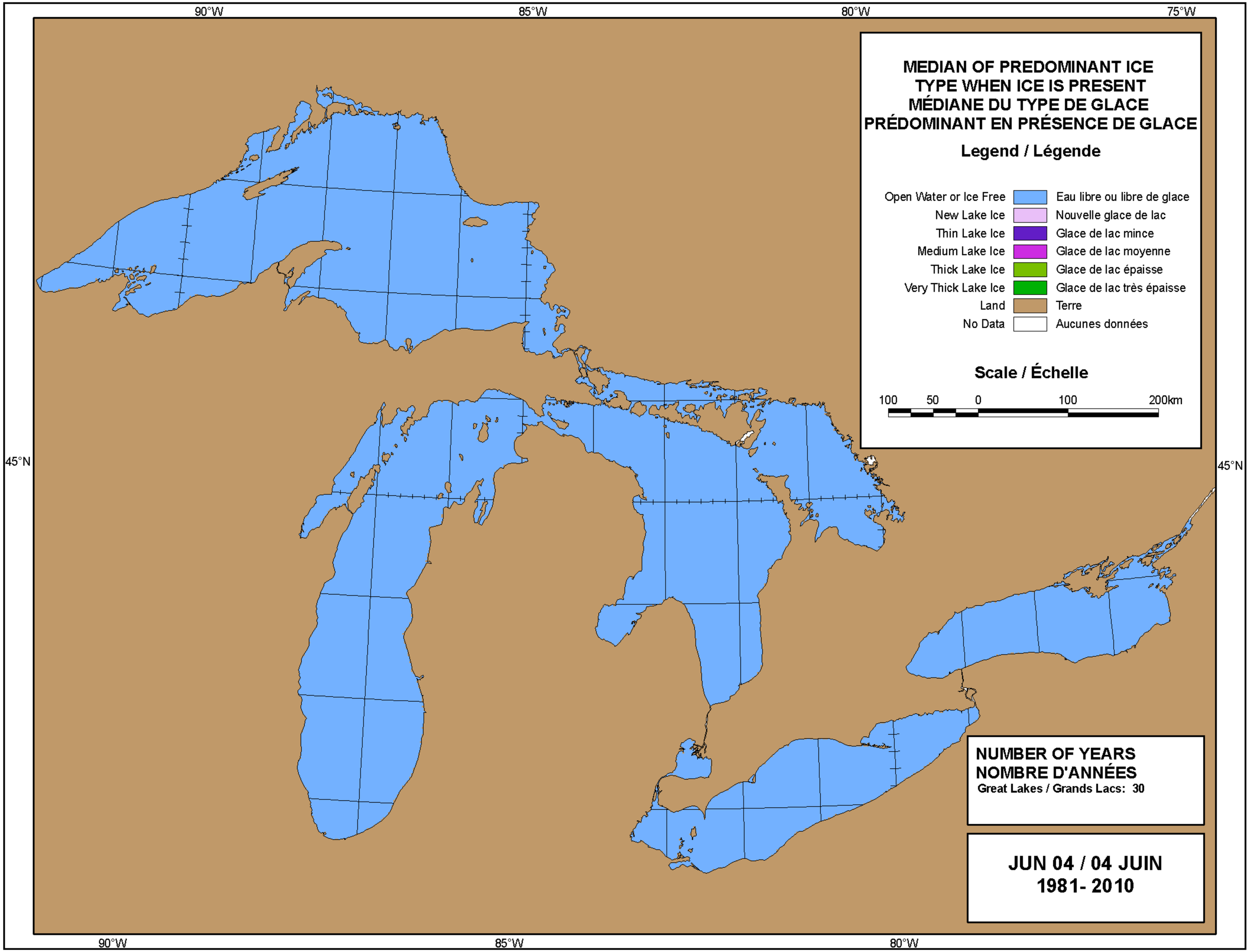
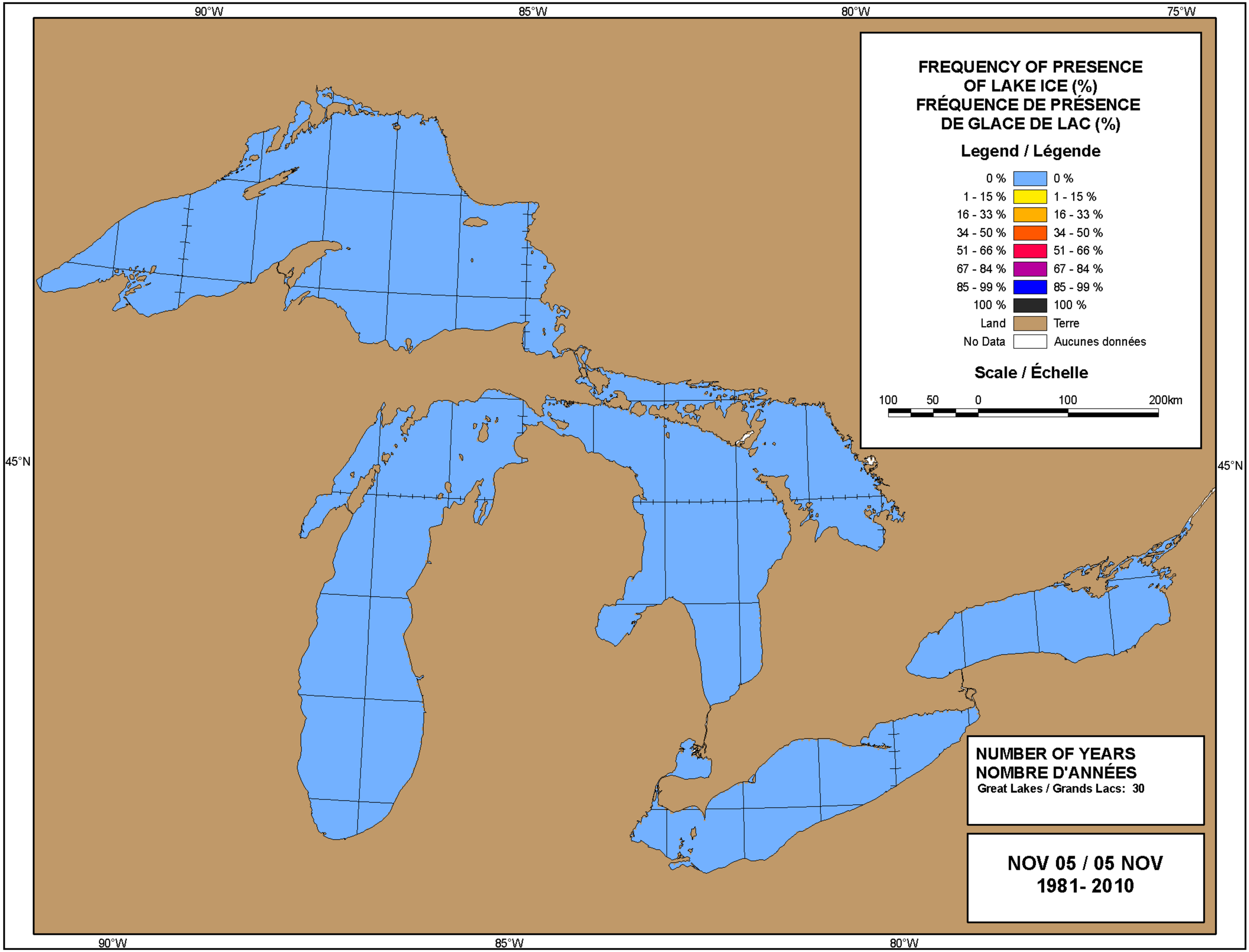
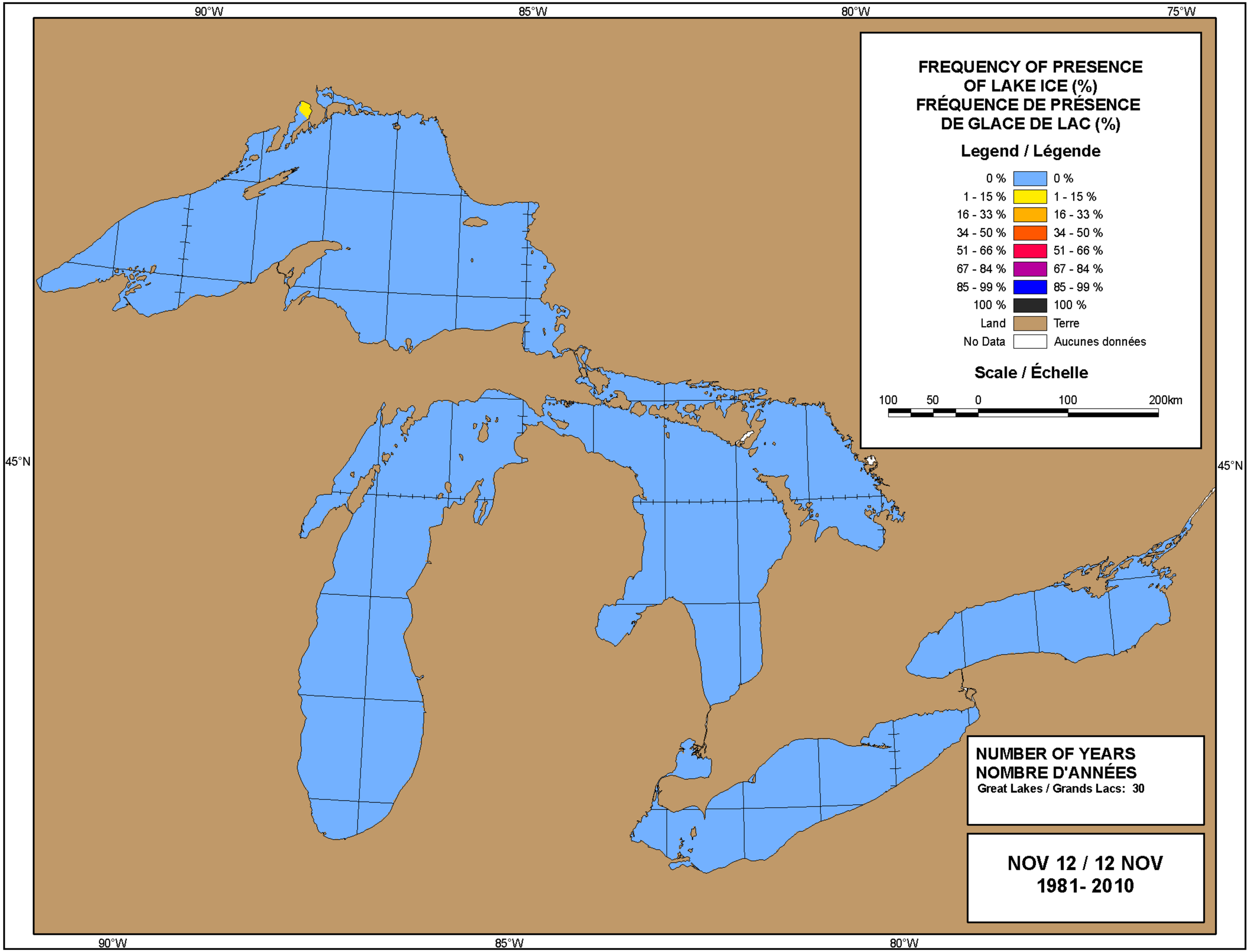
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 21 / 21 MAI
1981- 2010

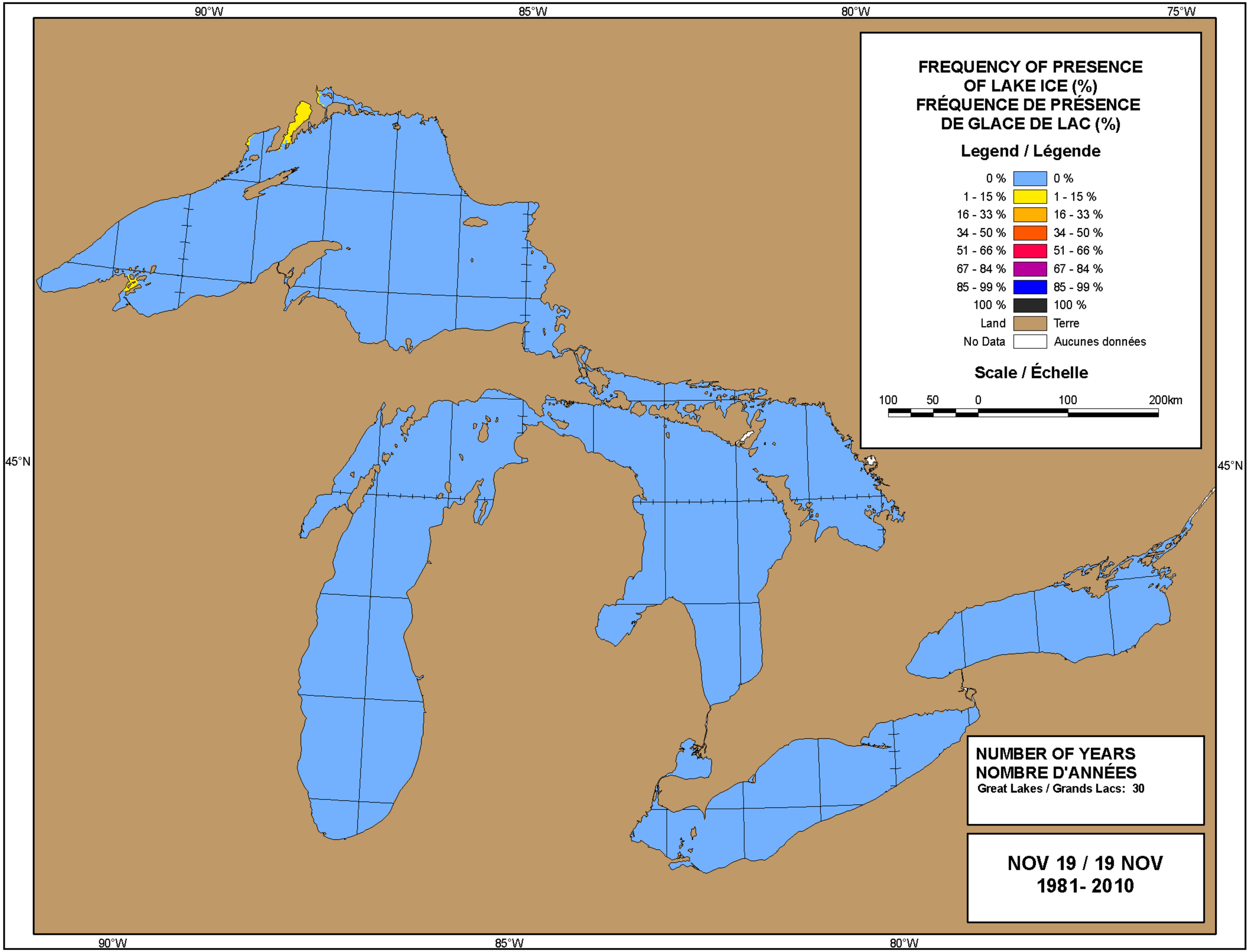

90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 28 / 28 MAI
1981- 2010

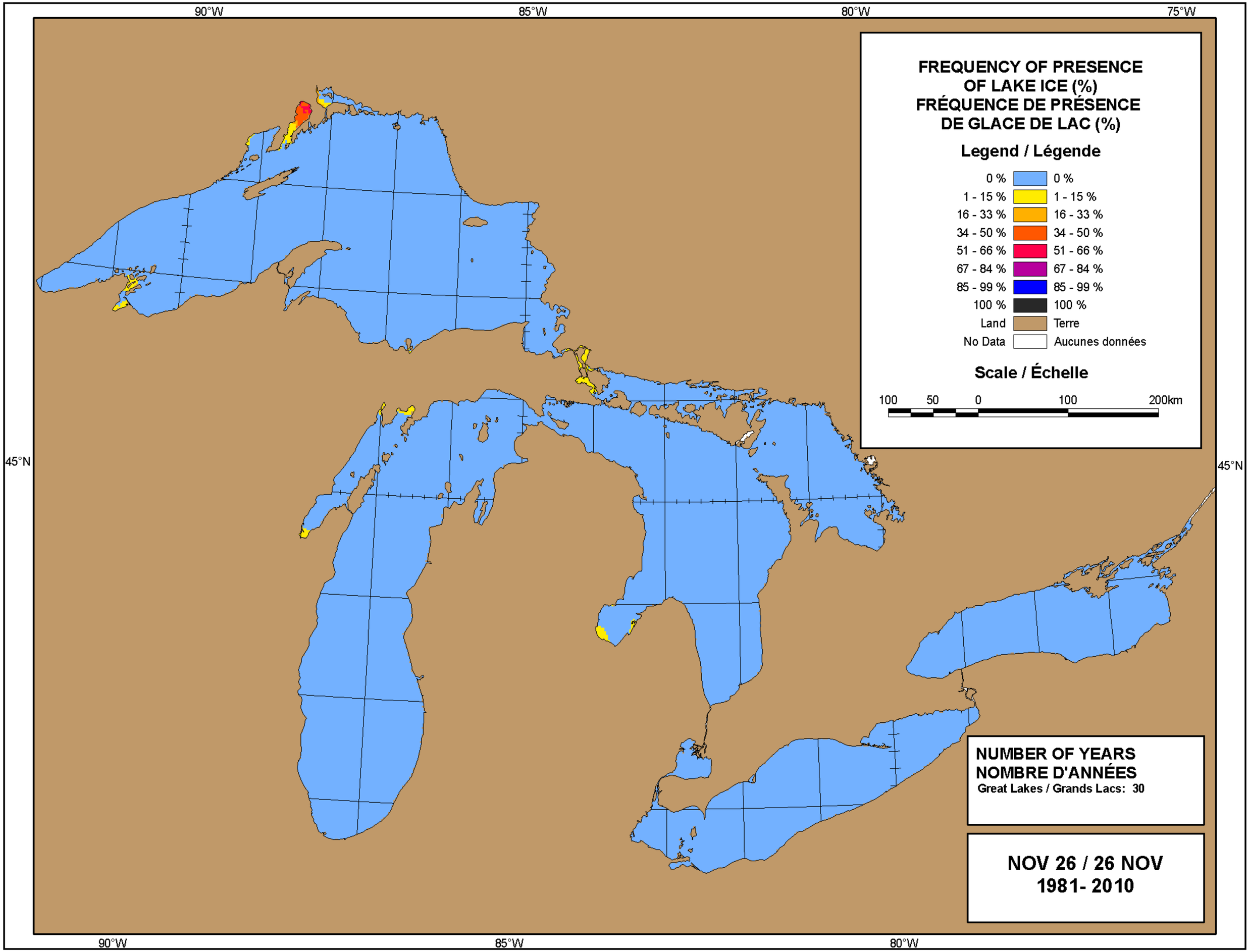

90°W
85°W
80°W
75°W
45°N
MEDIAN OF PREDOMINANT ICE TYPE WHEN ICE IS PRESENT
MÉDIANE DU TYPE DE GLACE PRÉDOMINANT EN PRÉSENCE DE GLACE
Legend / Légende
Open Water or Ice Free
Eau libre ou libre de glace
New Lake Ice
Nouvelle glace de lac
Thin Lake Ice
Glace de lac mince
Medium Lake Ice
Glace de lac moyenne
Thick Lake Ice
Glace de lac épaisse
Very Thick Lake Ice
Glace de lac très épaisse
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JUN 04 / 04 JUIN
1981- 2010

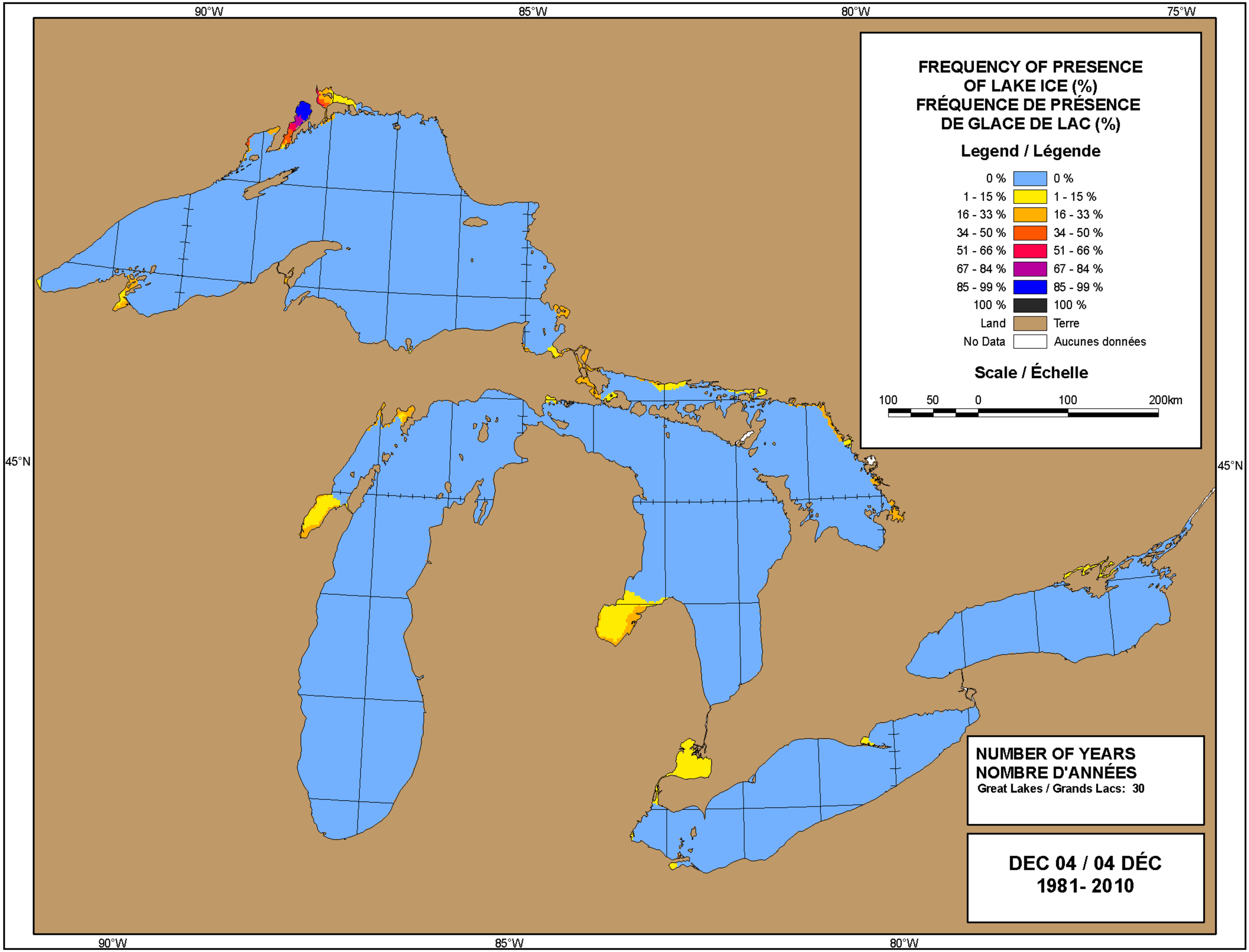
30-Year Frequency of Presence of Lake Ice (%) Charts

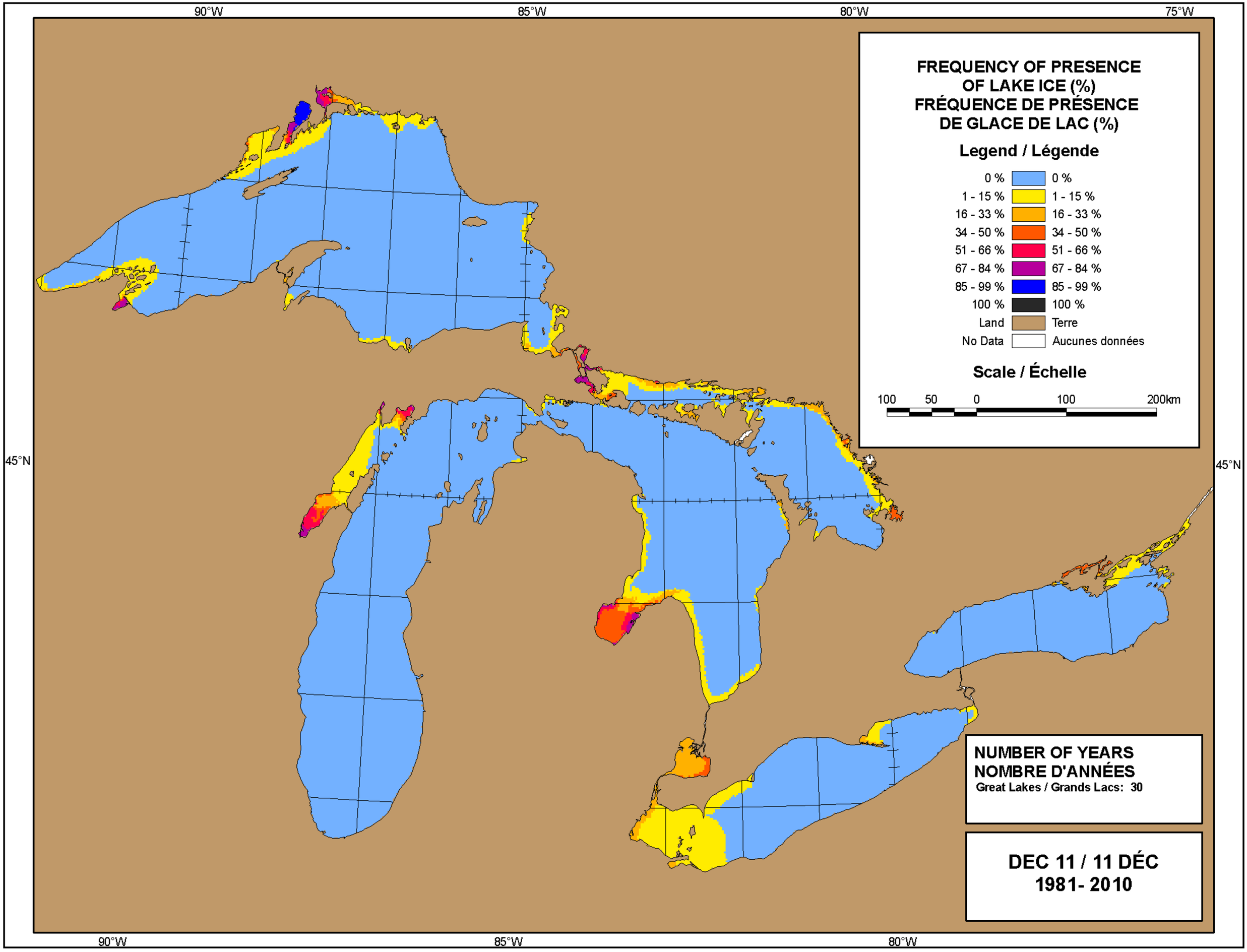

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 05 / 05 NOV
1981- 2010

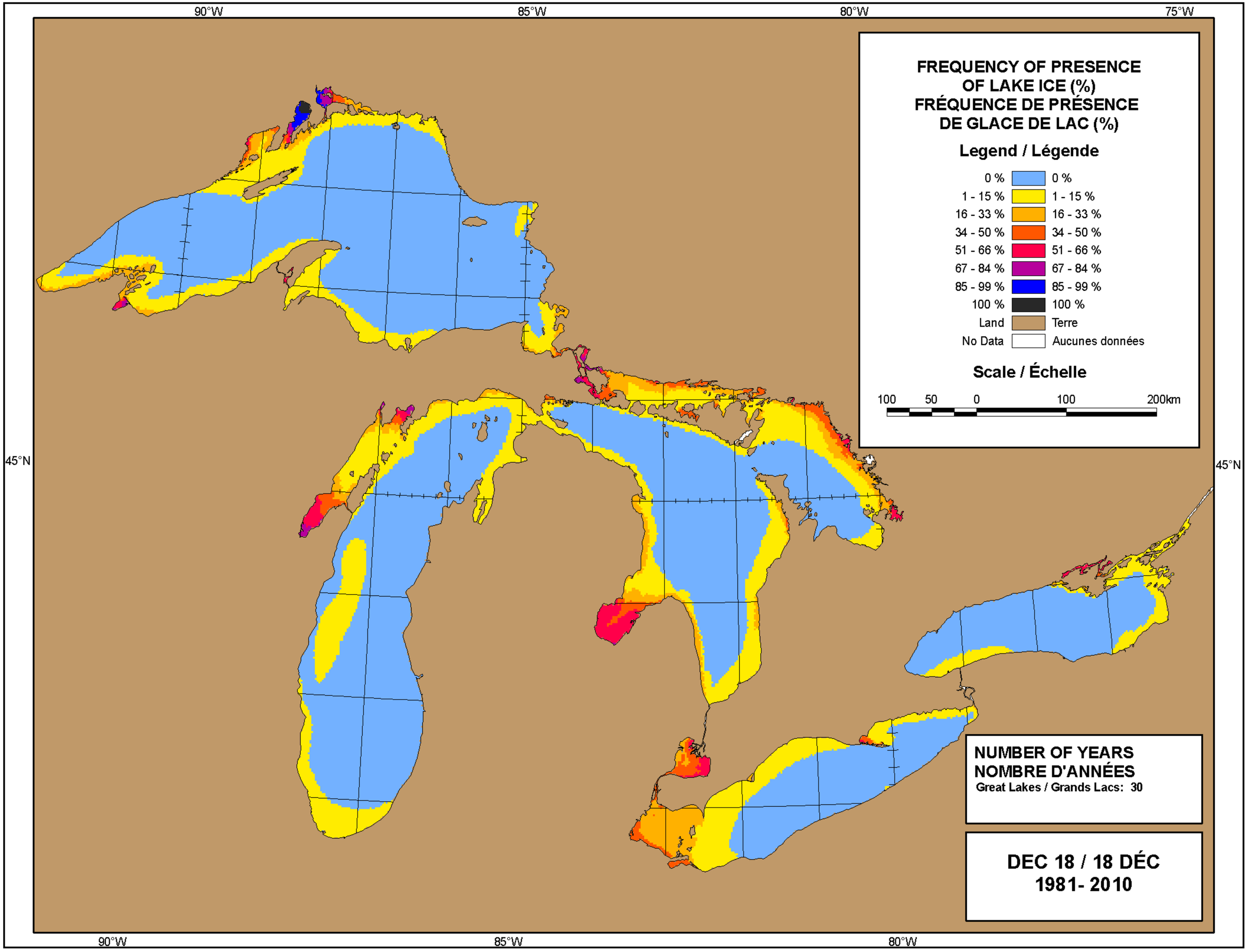

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 12 / 12 NOV
1981- 2010

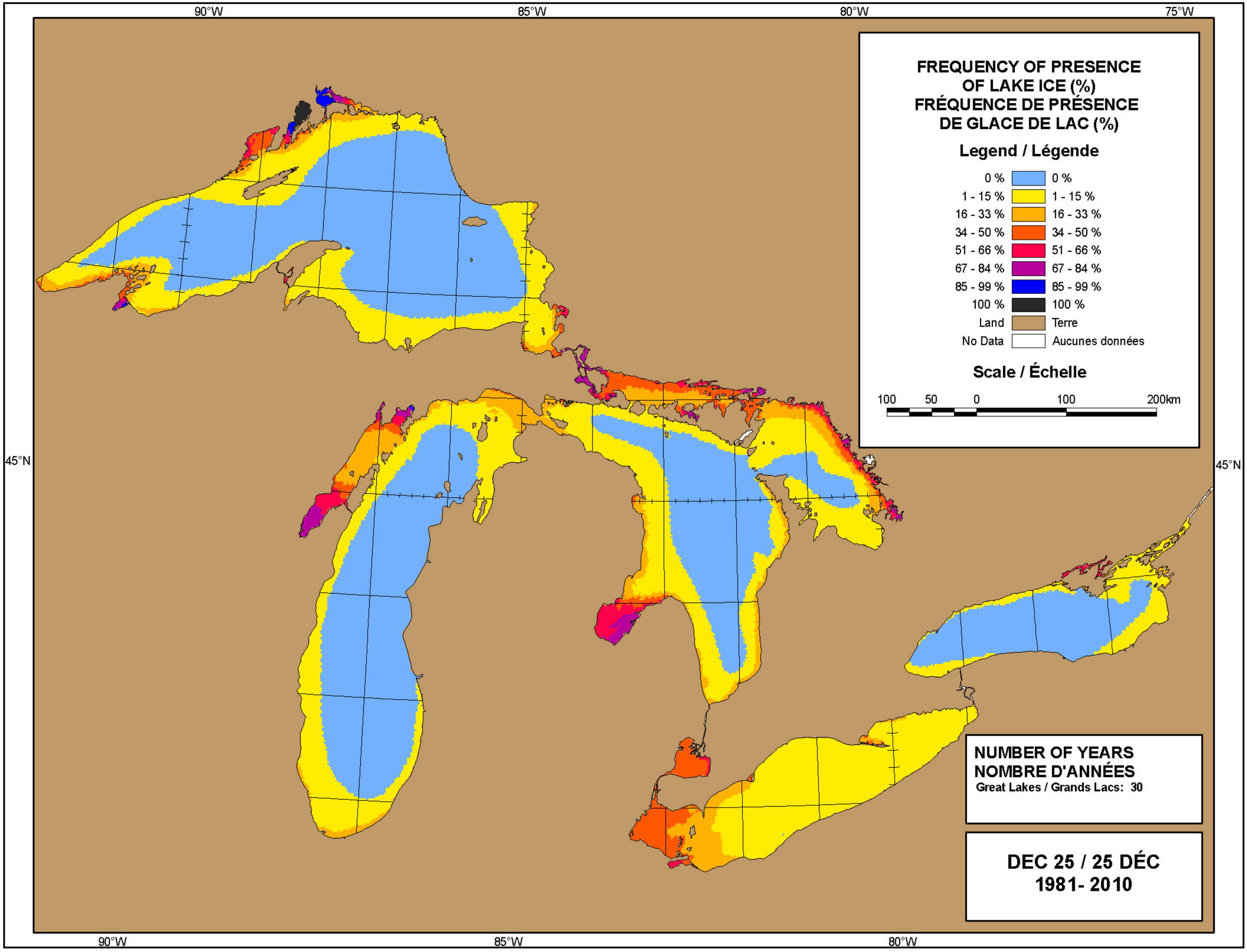

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 19 / 19 NOV
1981- 2010

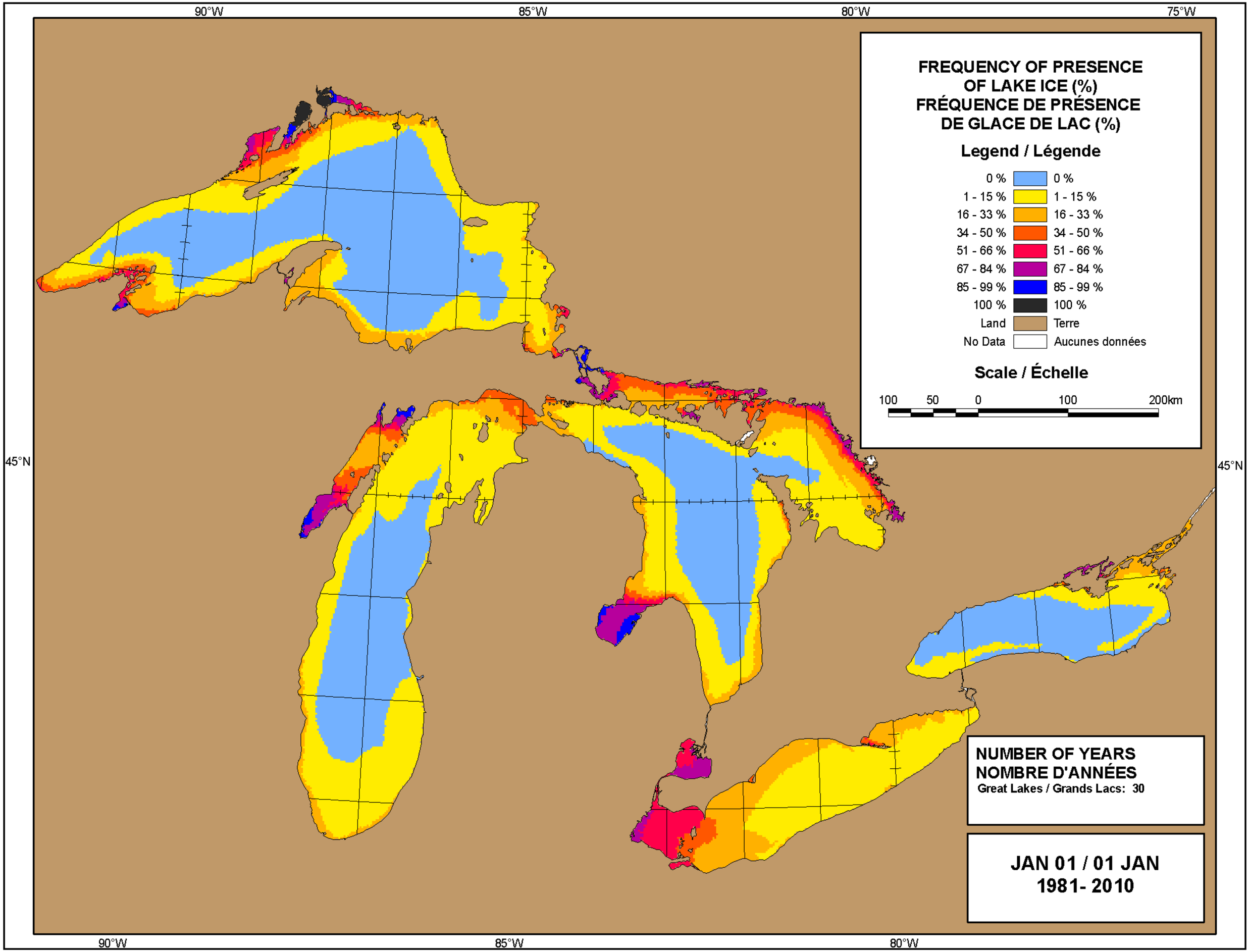

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 26 / 26 NOV
1981- 2010

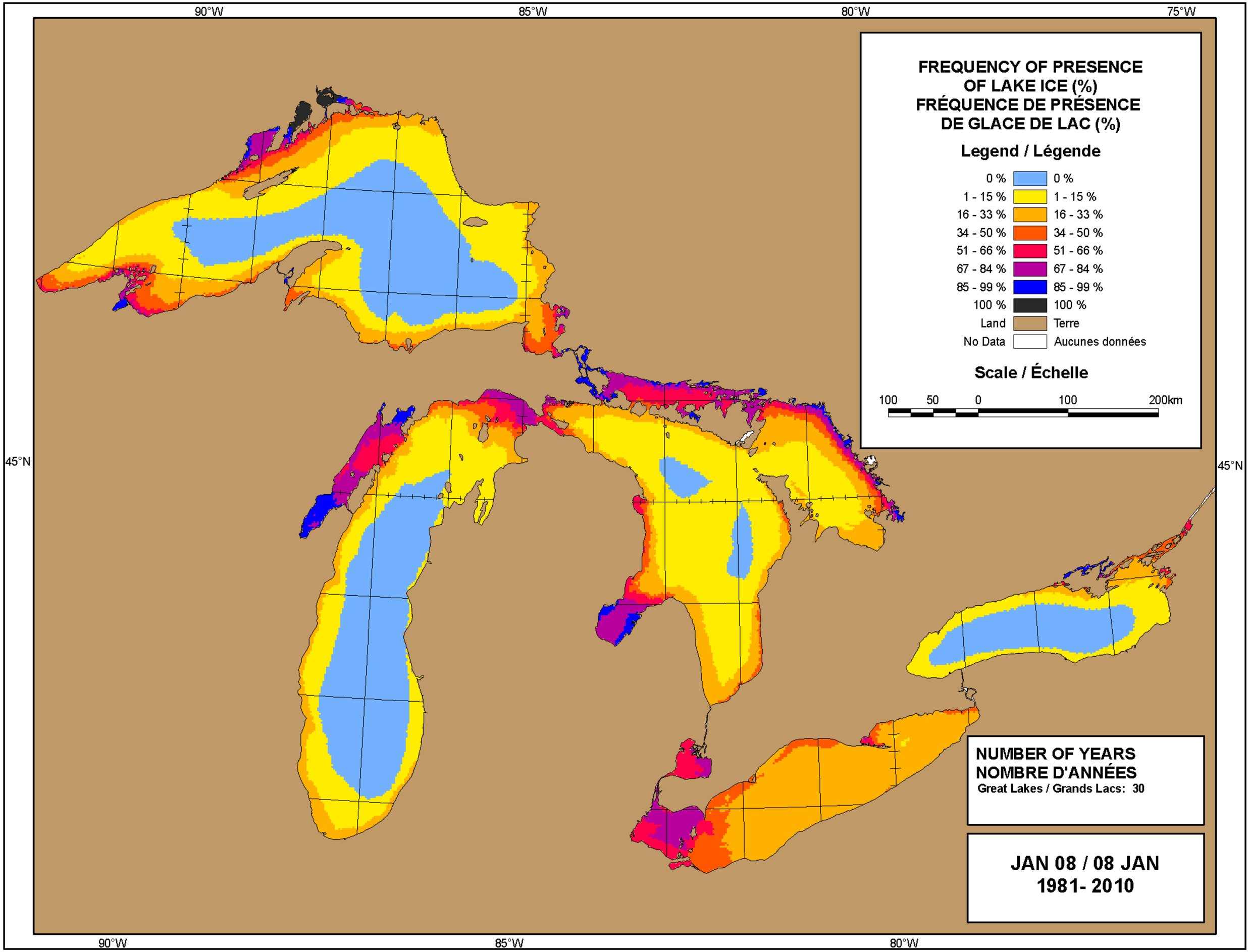

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 04 / 04 DÉC
1981- 2010

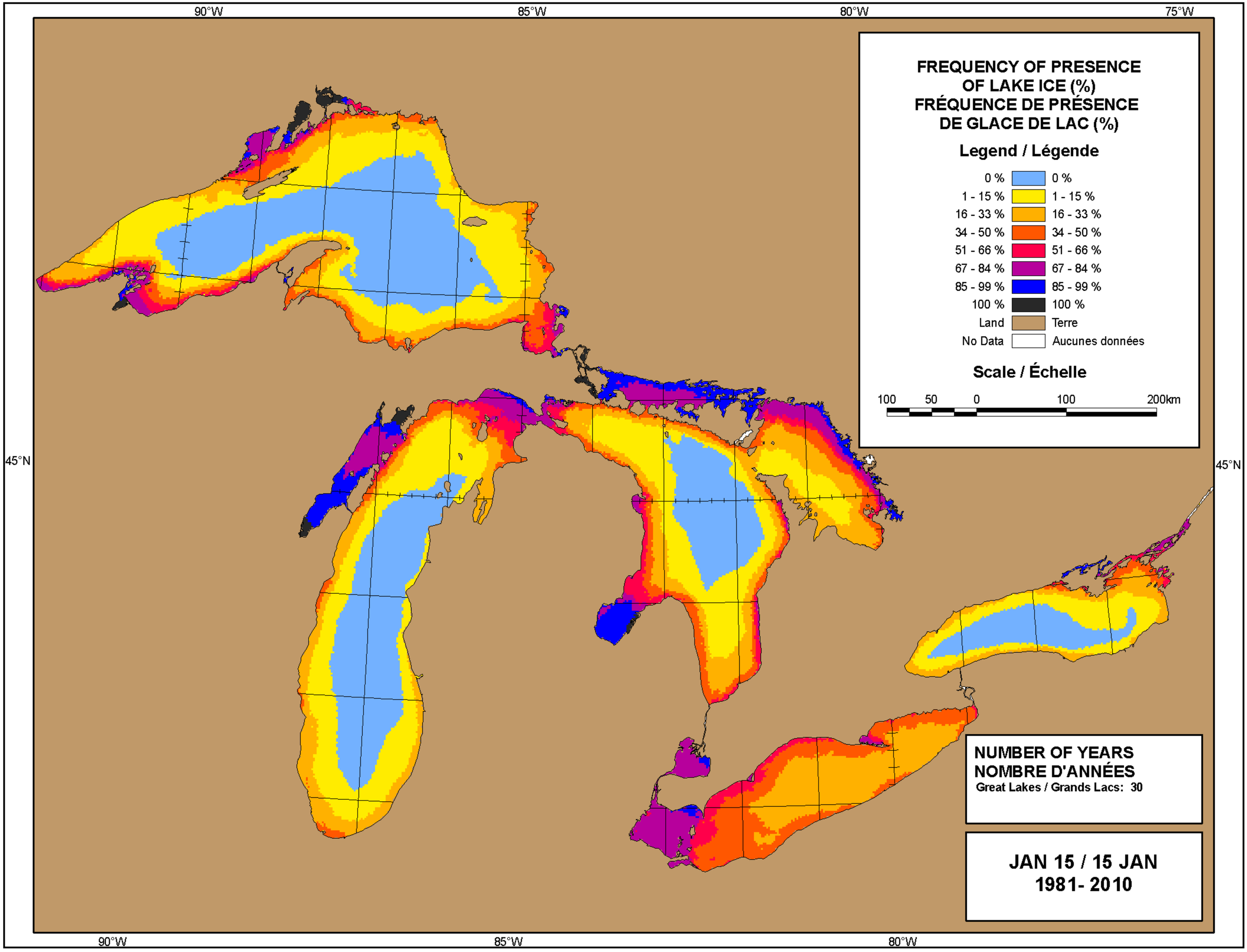

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 11 / 11 DÉC
1981- 2010

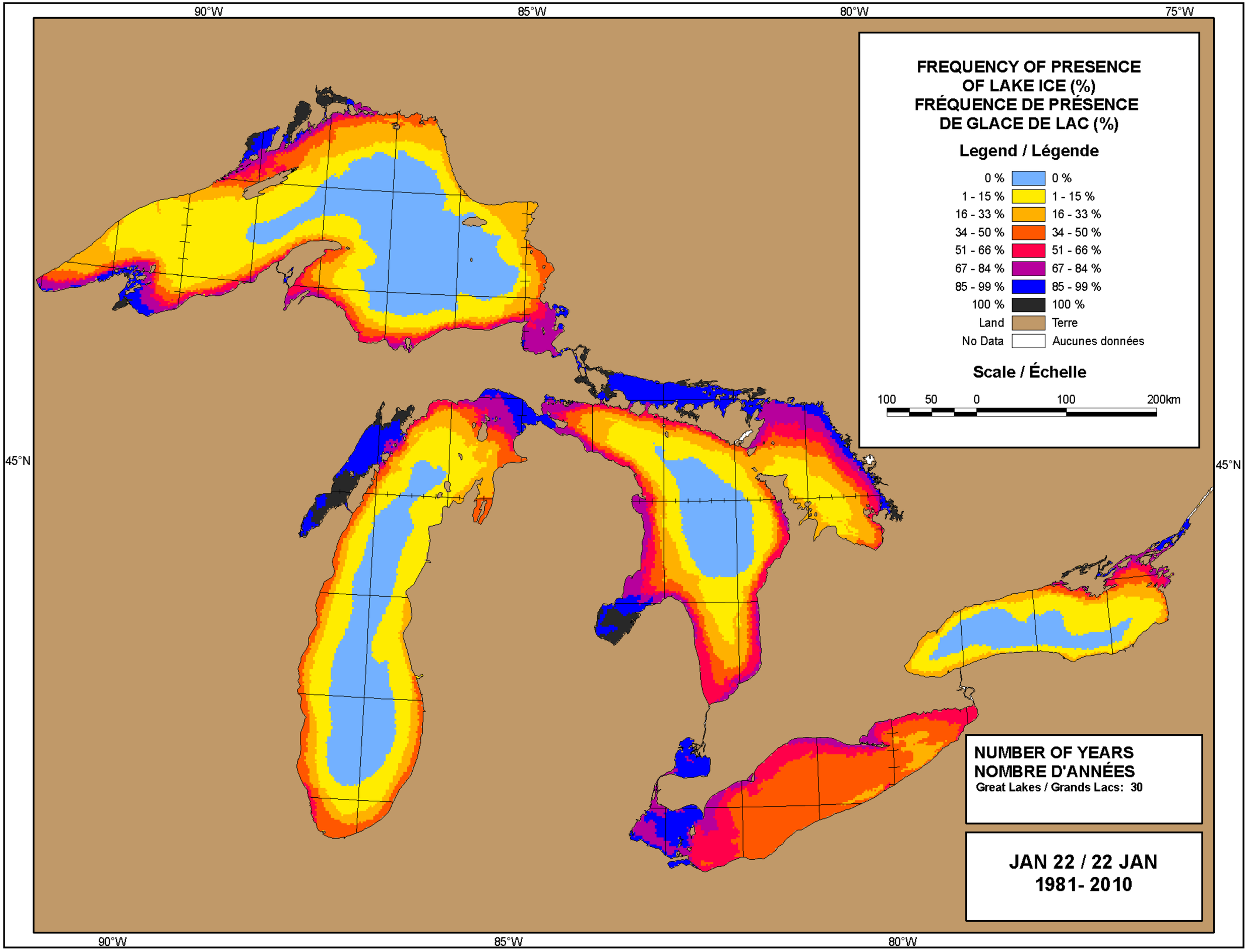

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 18 / 18 DÉC
1981- 2010

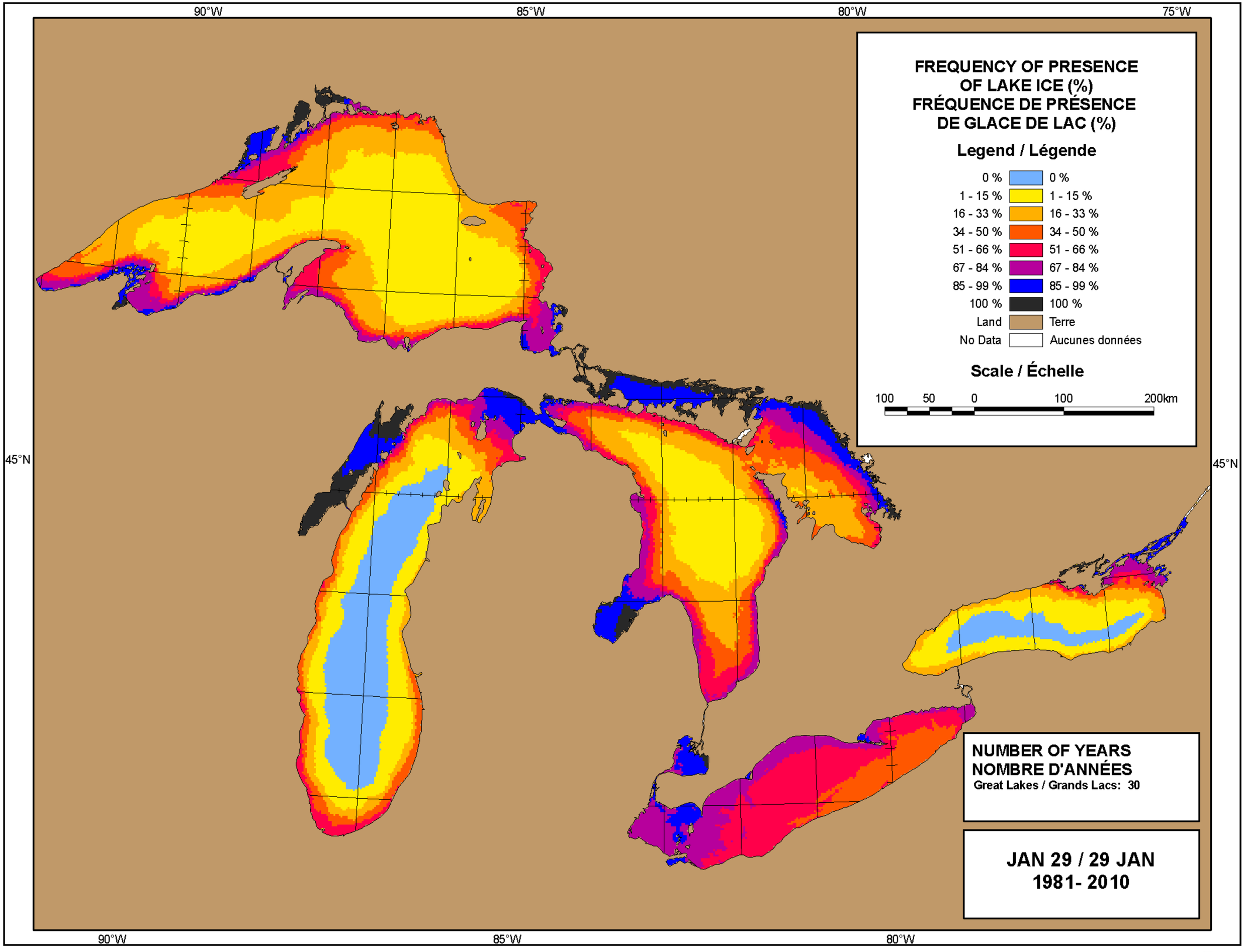

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 25 / 25 DÉC
1981- 2010

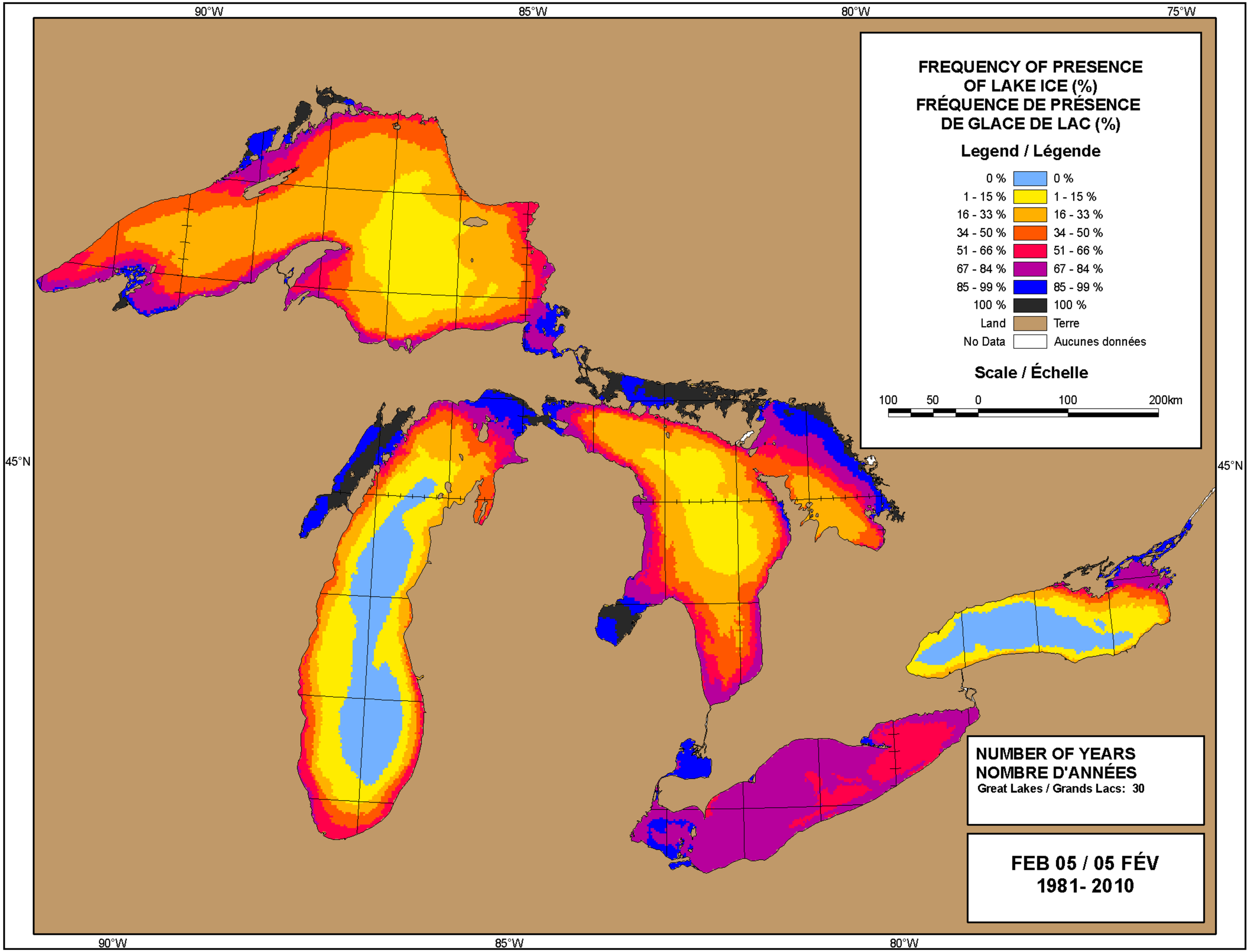

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 01 / 01 JAN
1981- 2010

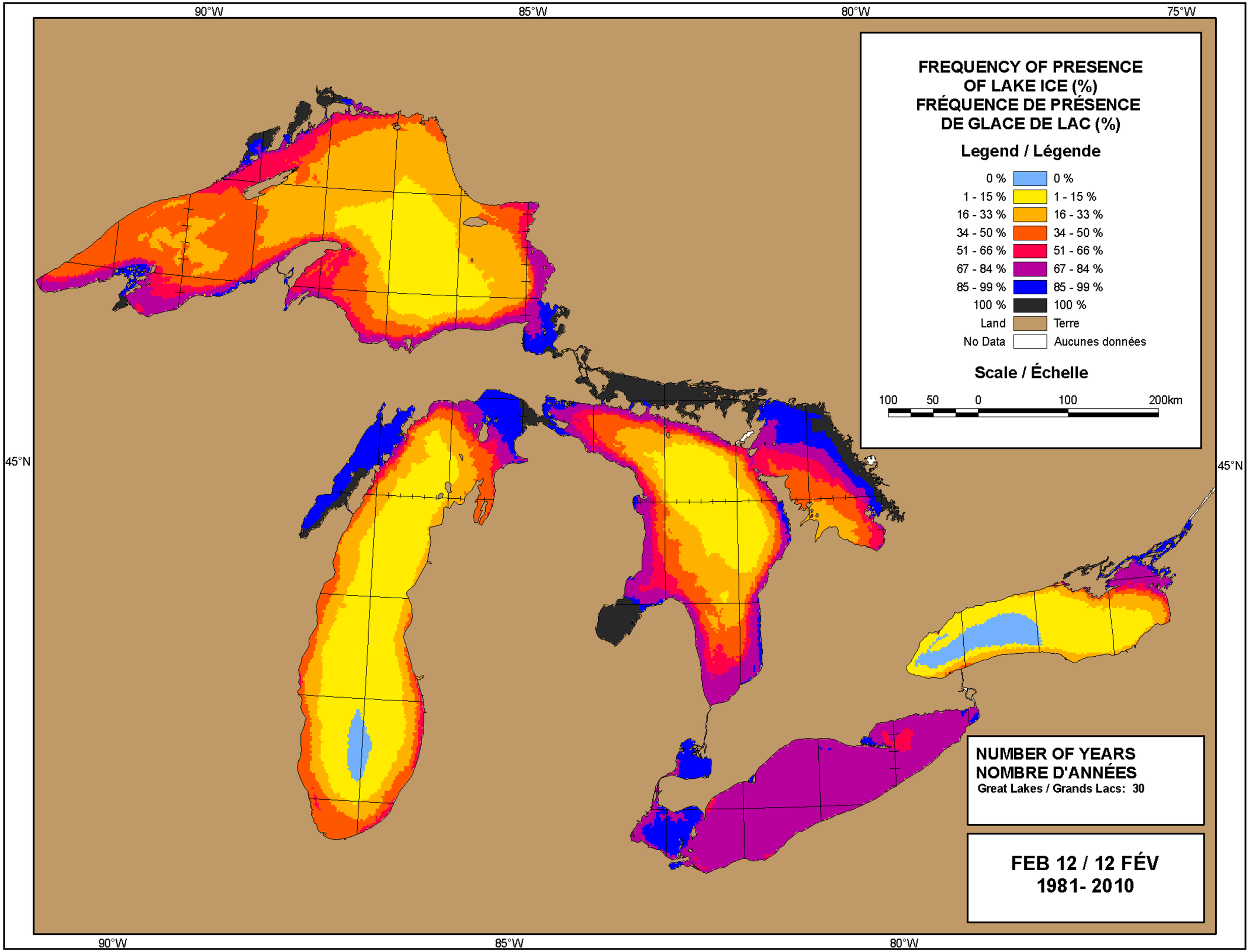

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 08 / 08 JAN
1981- 2010

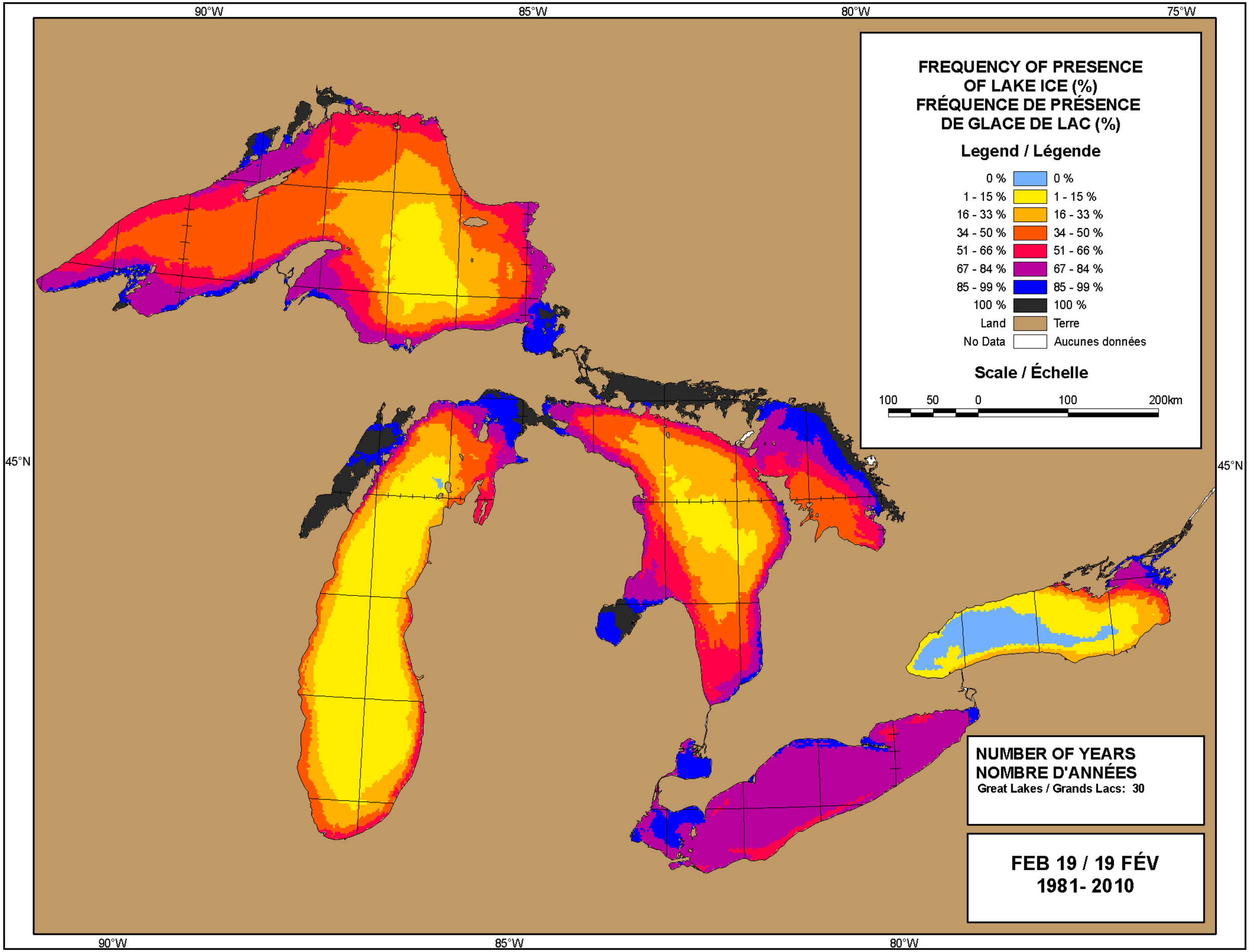

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 15 / 15 JAN
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 22 / 22 JAN
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 29 / 29 JAN
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 05 / 05 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 12 / 12 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
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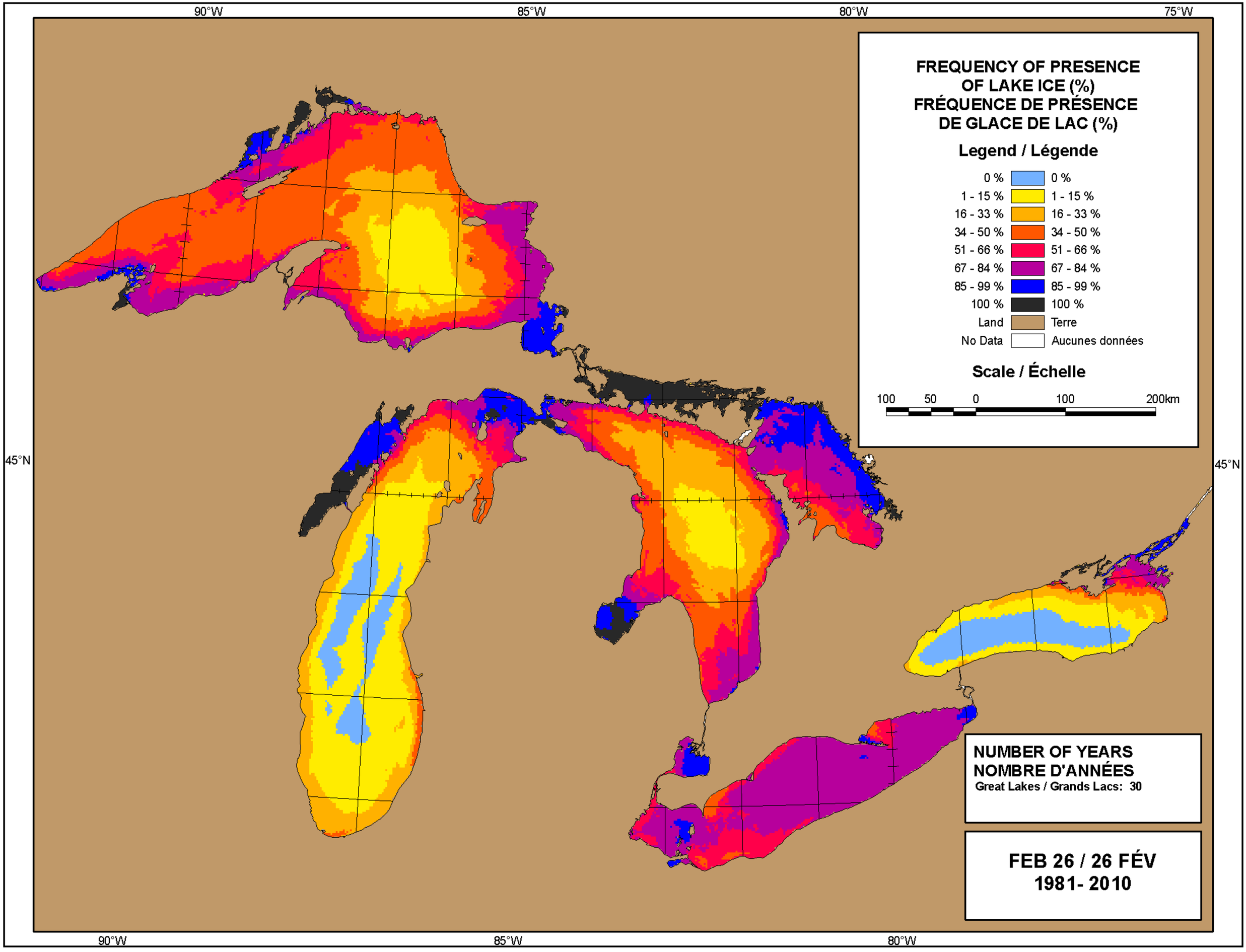
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 19 / 19 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
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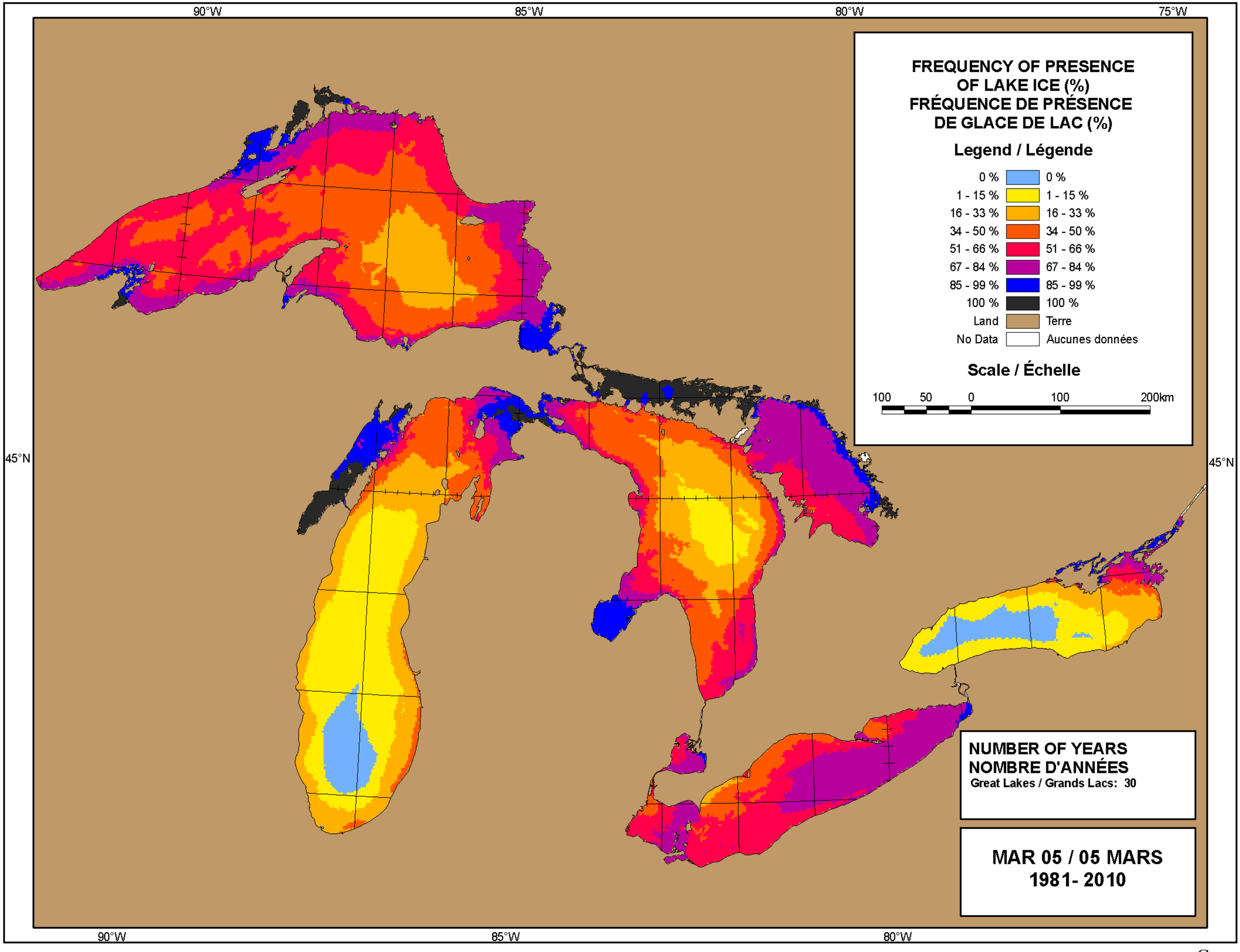
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 26 / 26 FÉV
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
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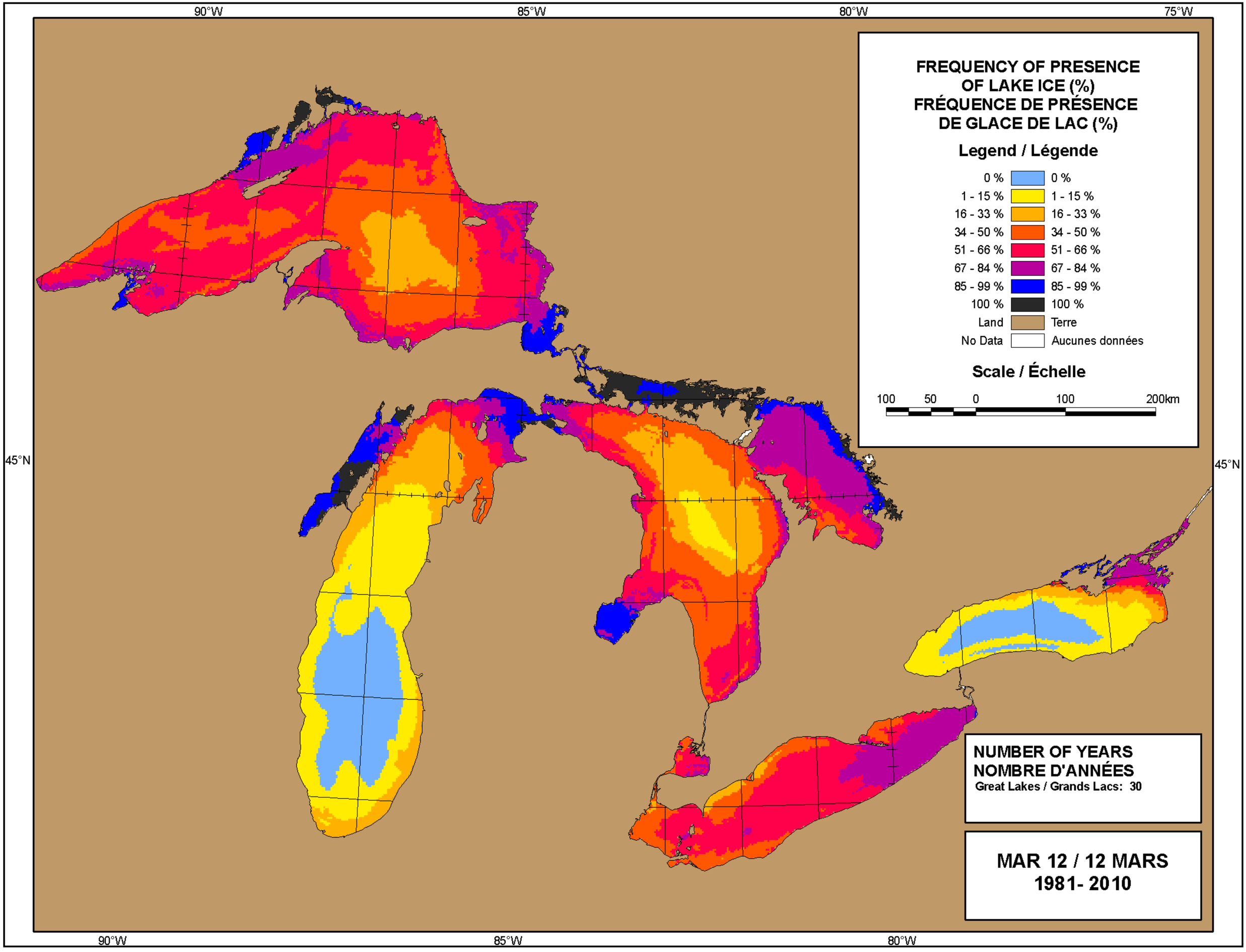
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 05 / 05 MARS
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
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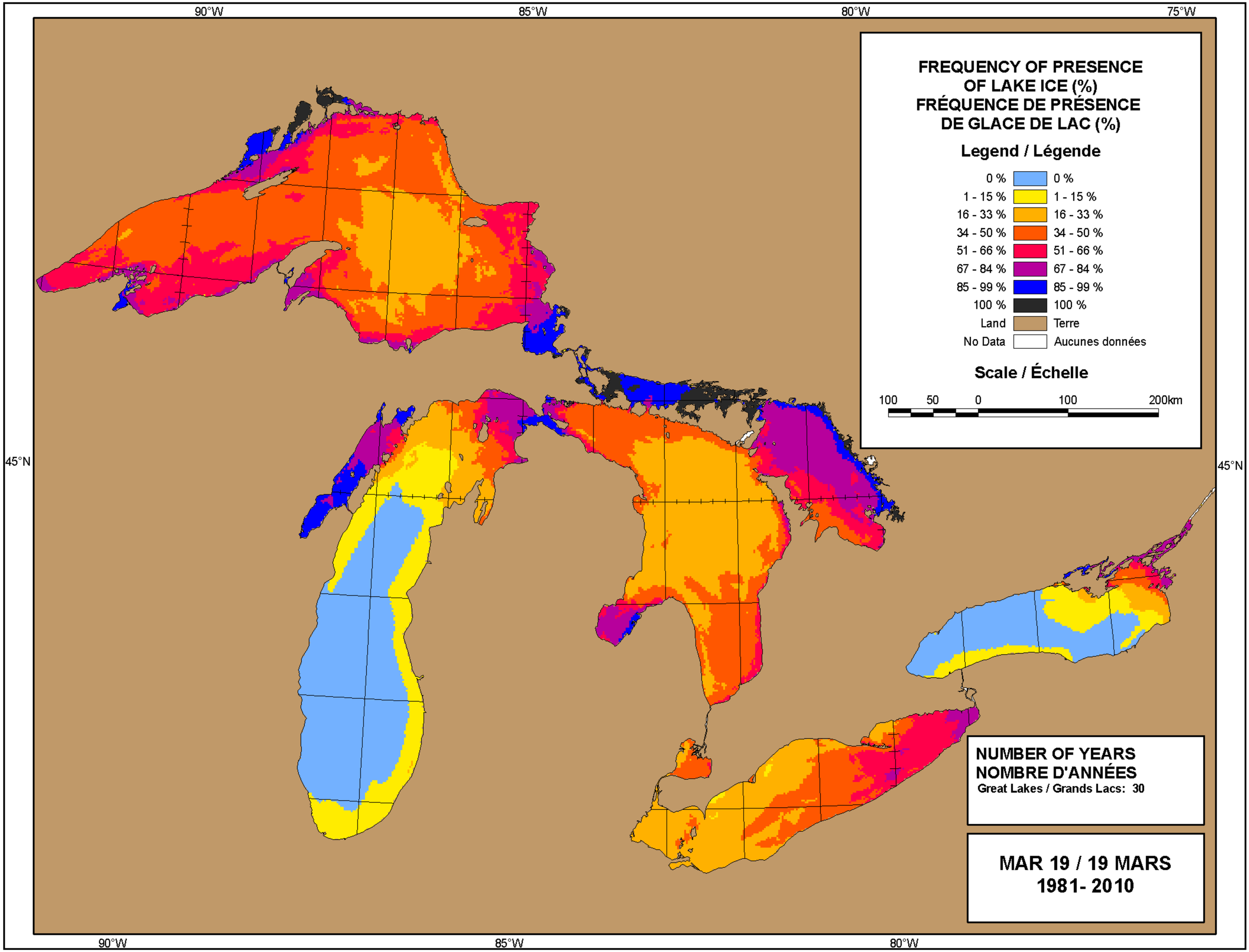
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 12 / 12 MARS
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
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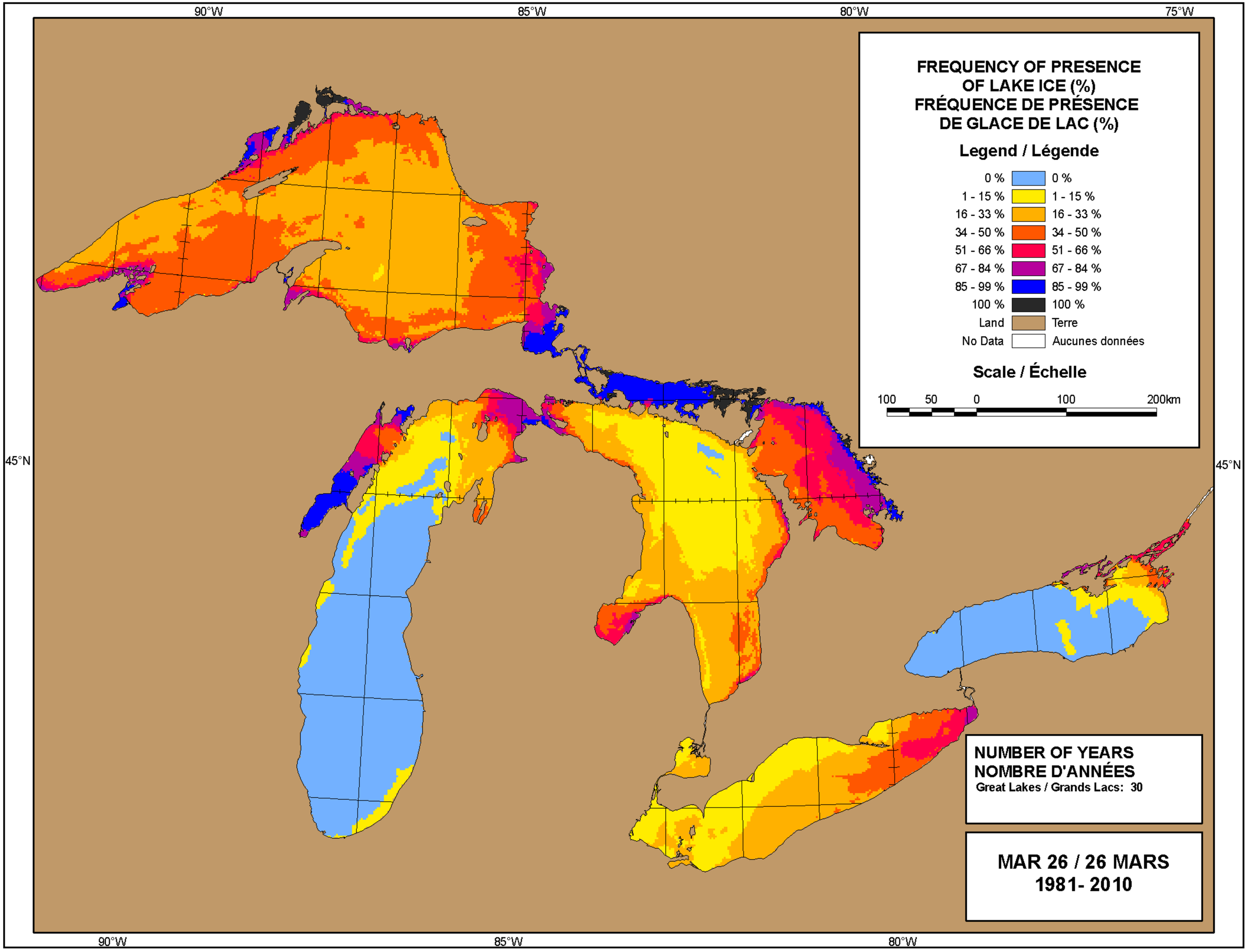
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 19 / 19 MARS
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
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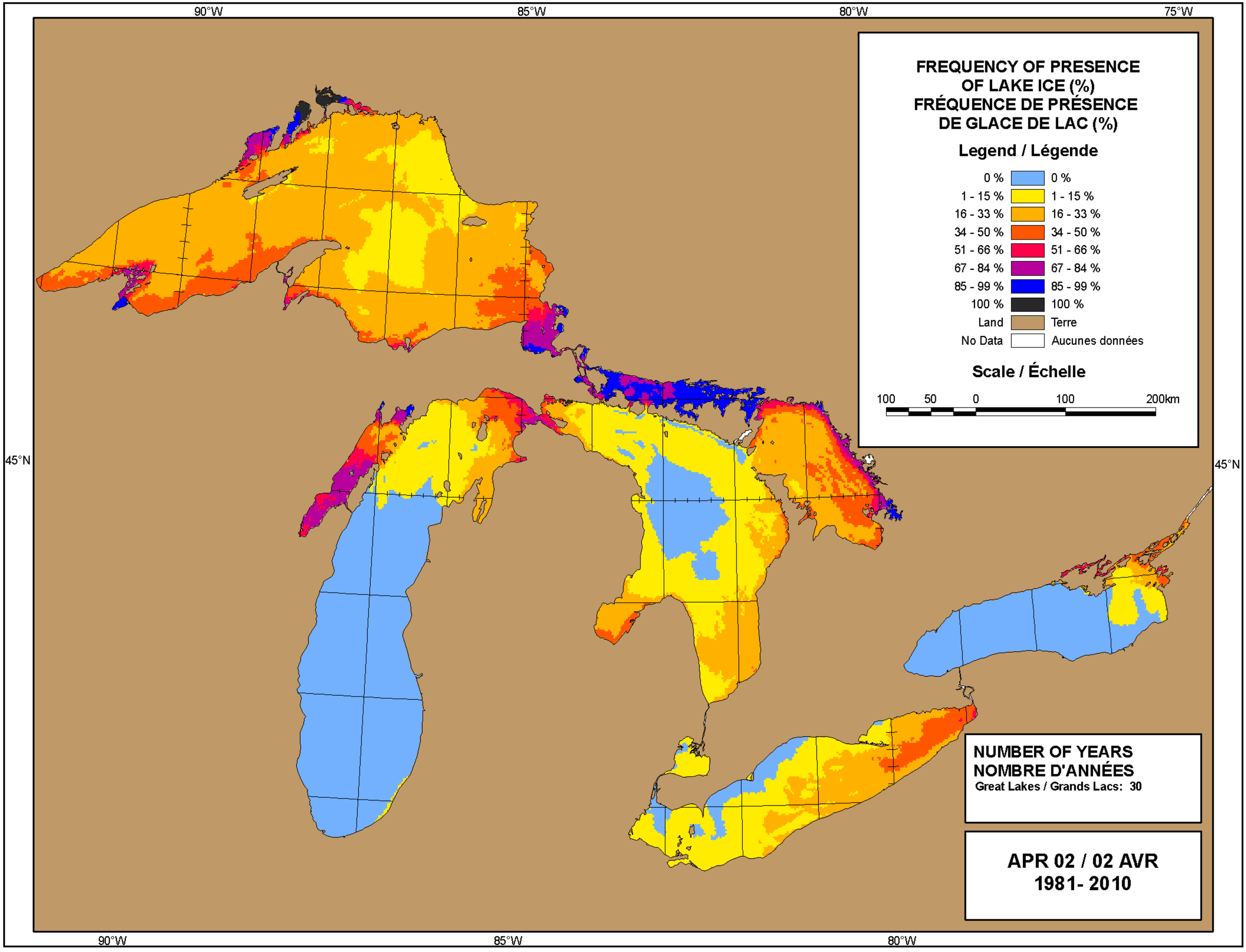
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 26 / 26 MARS
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
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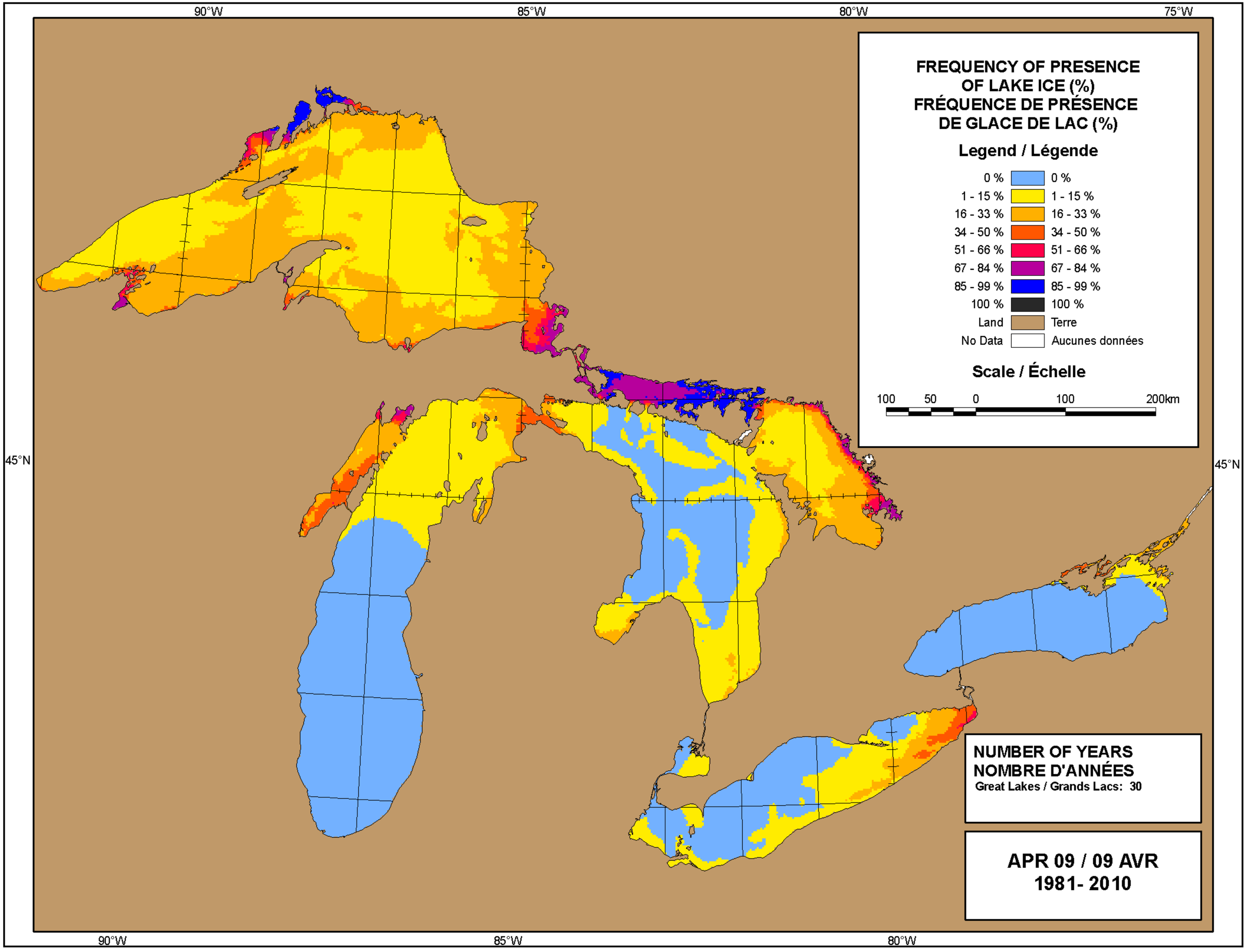
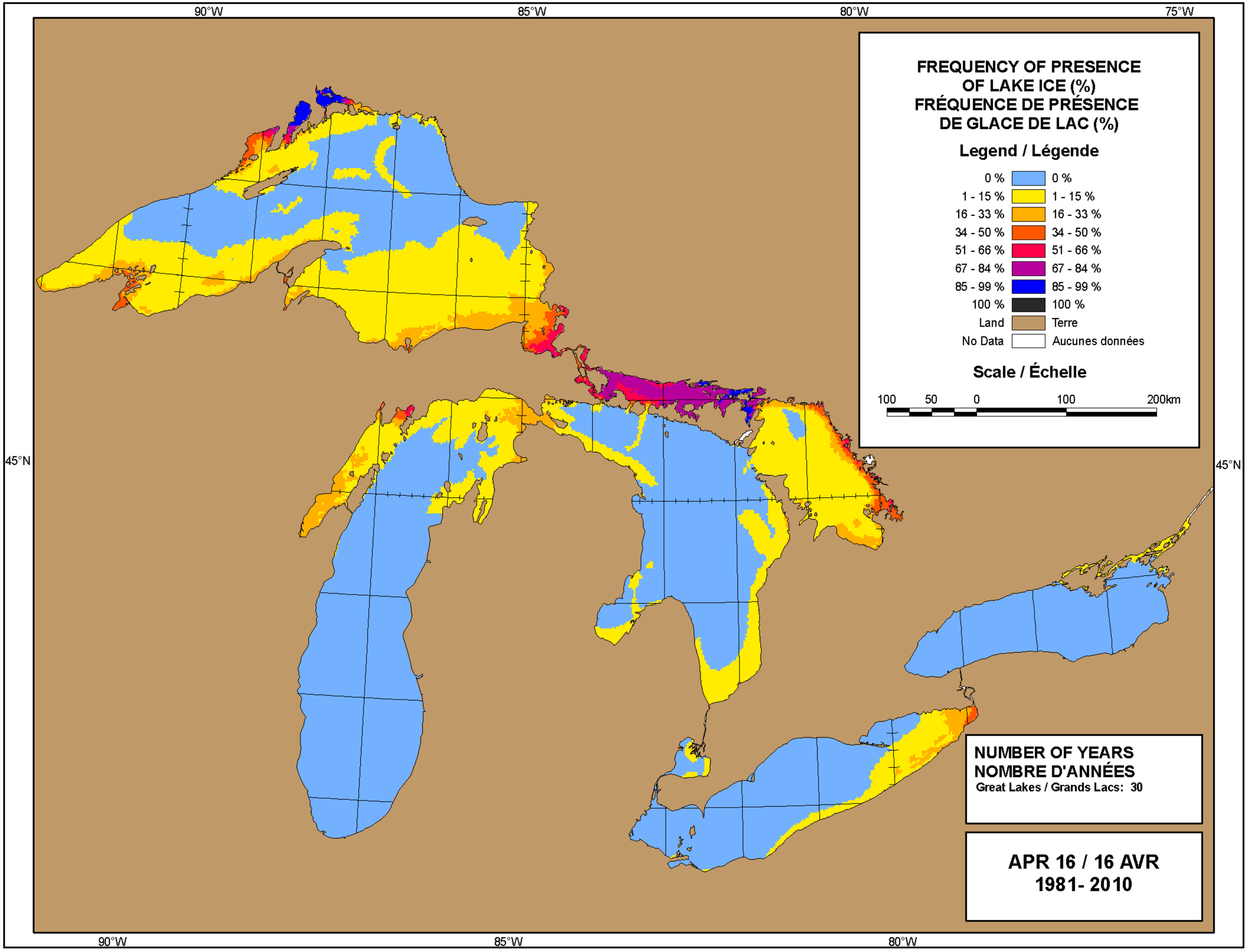
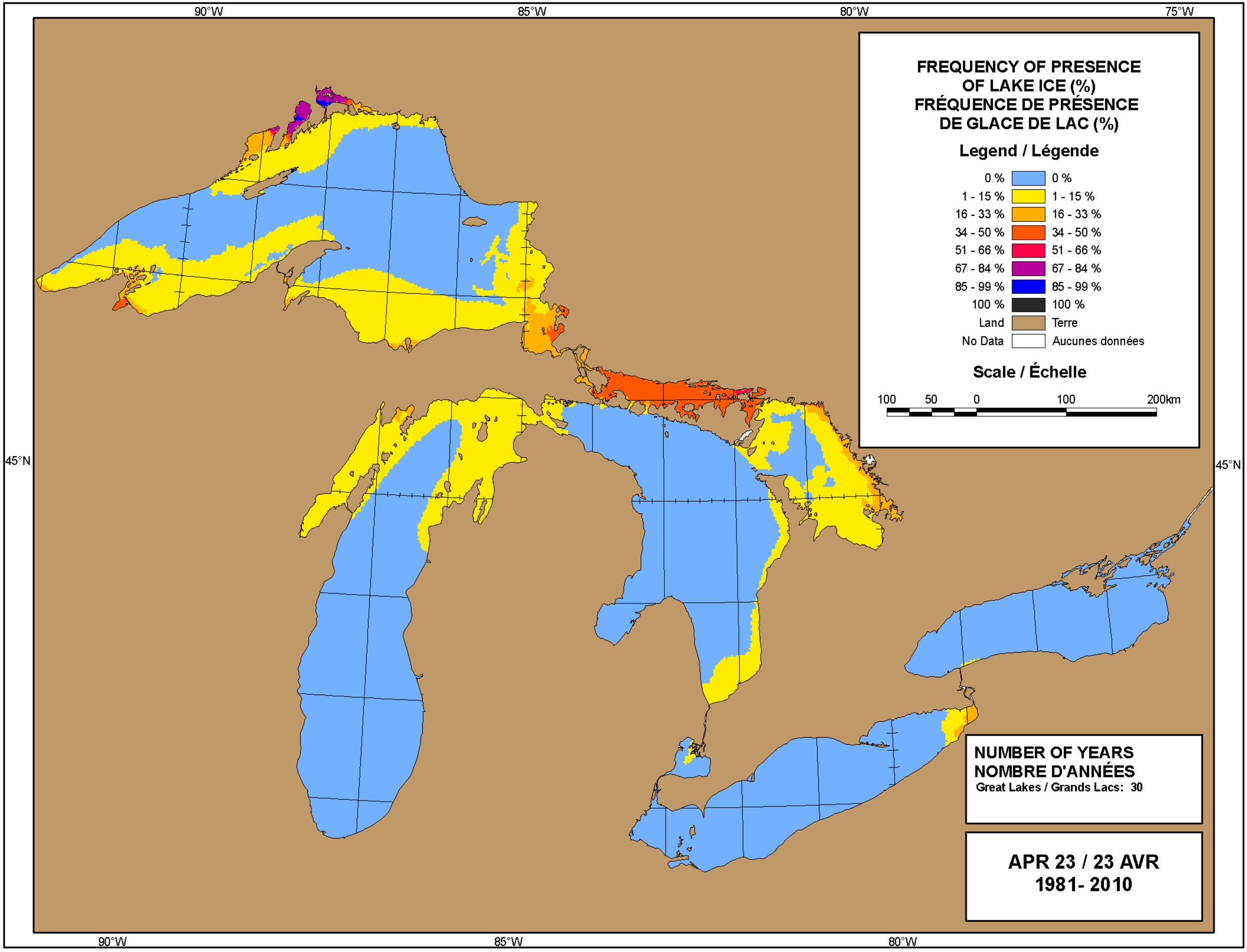
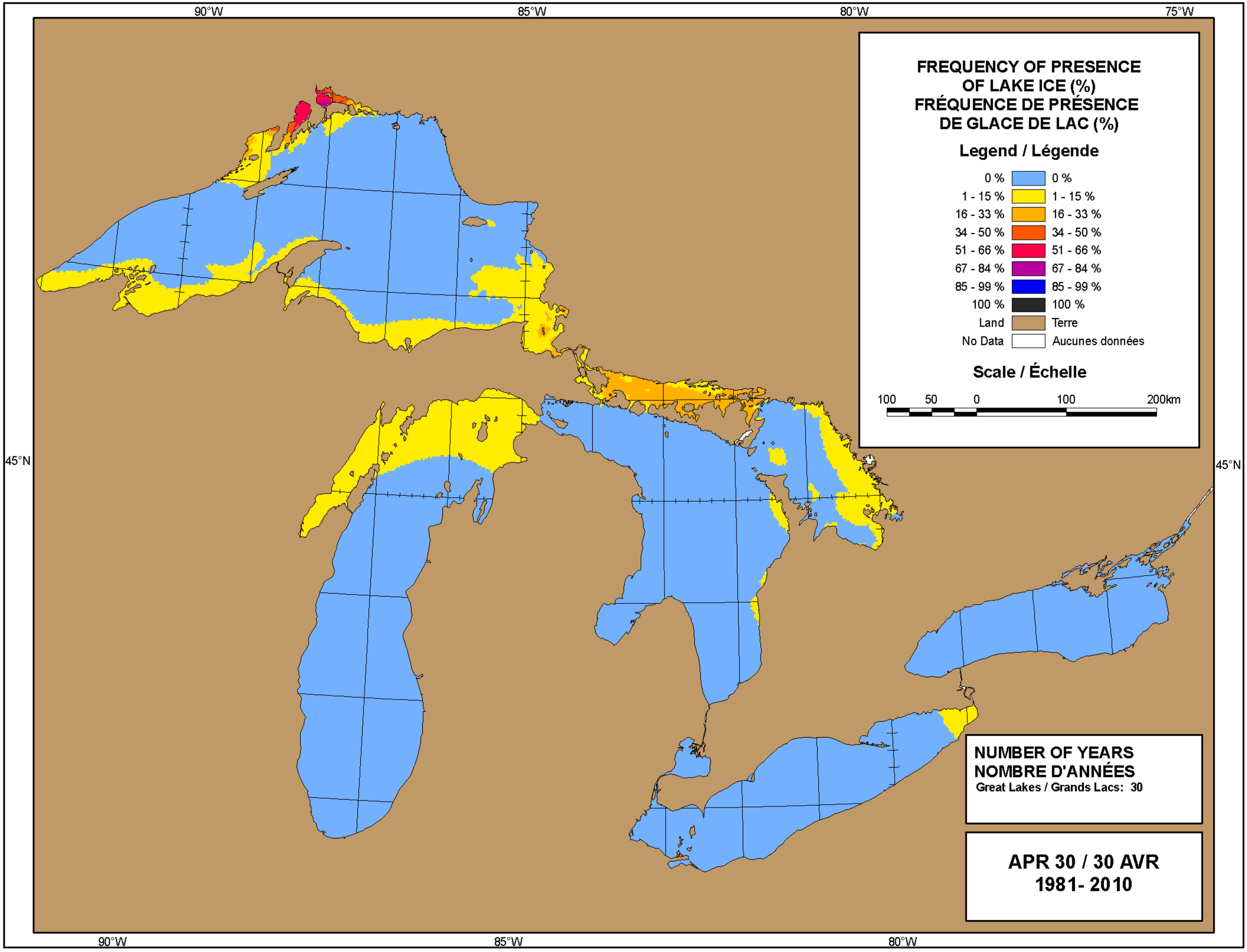
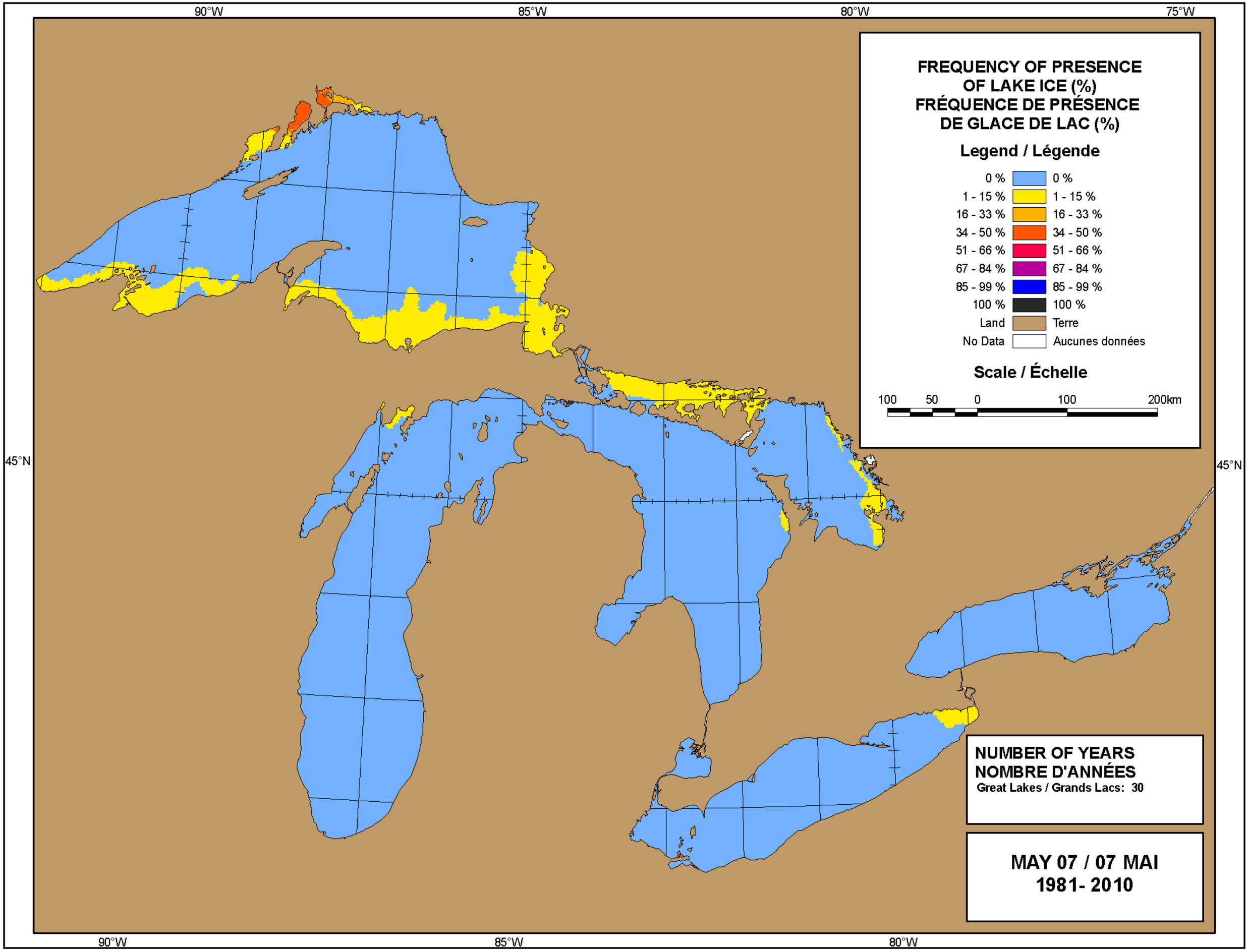
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 02 / 02 AVR
1981- 2010

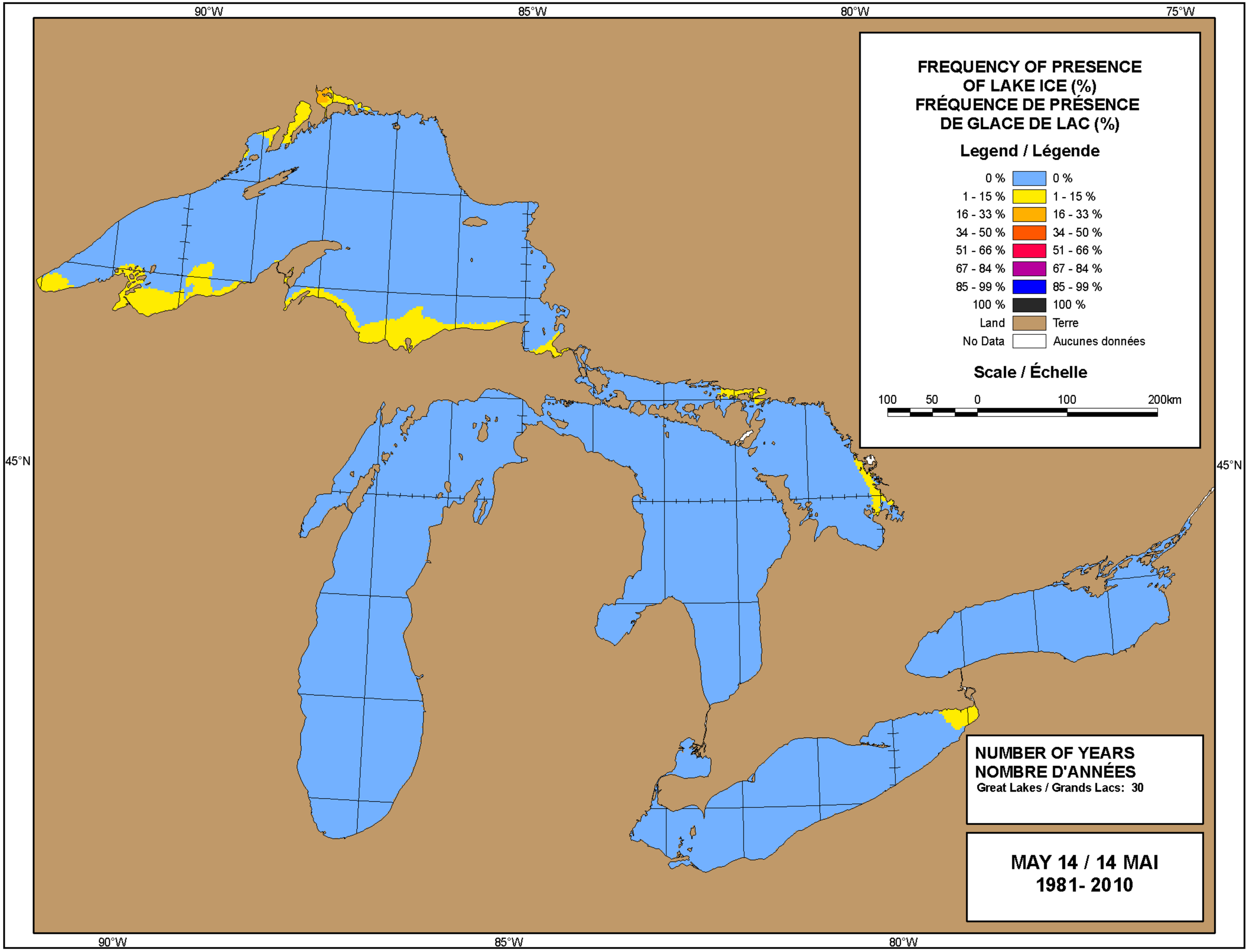

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 09 / 09 AVR
1981- 2010

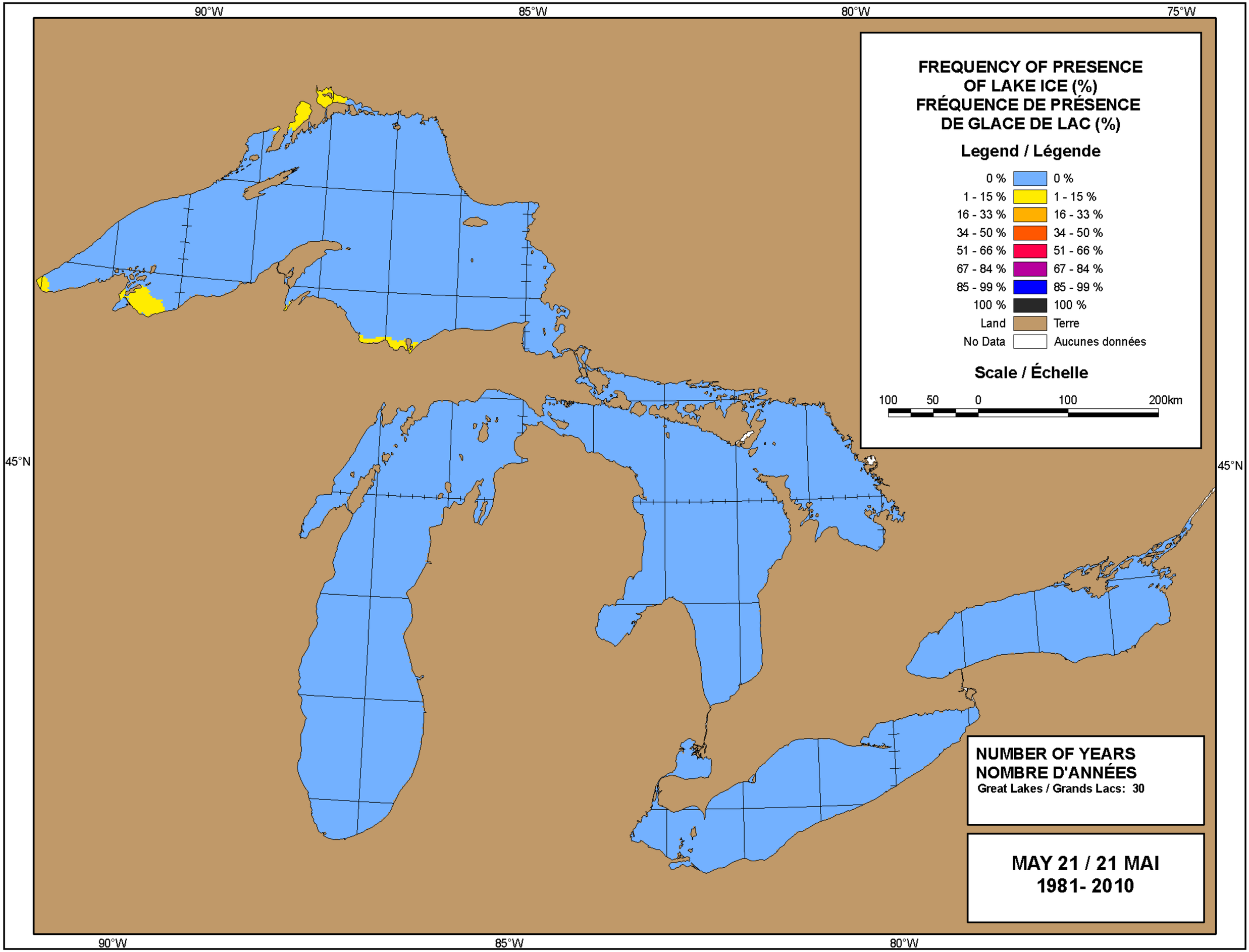

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 16 / 16 AVR
1981- 2010

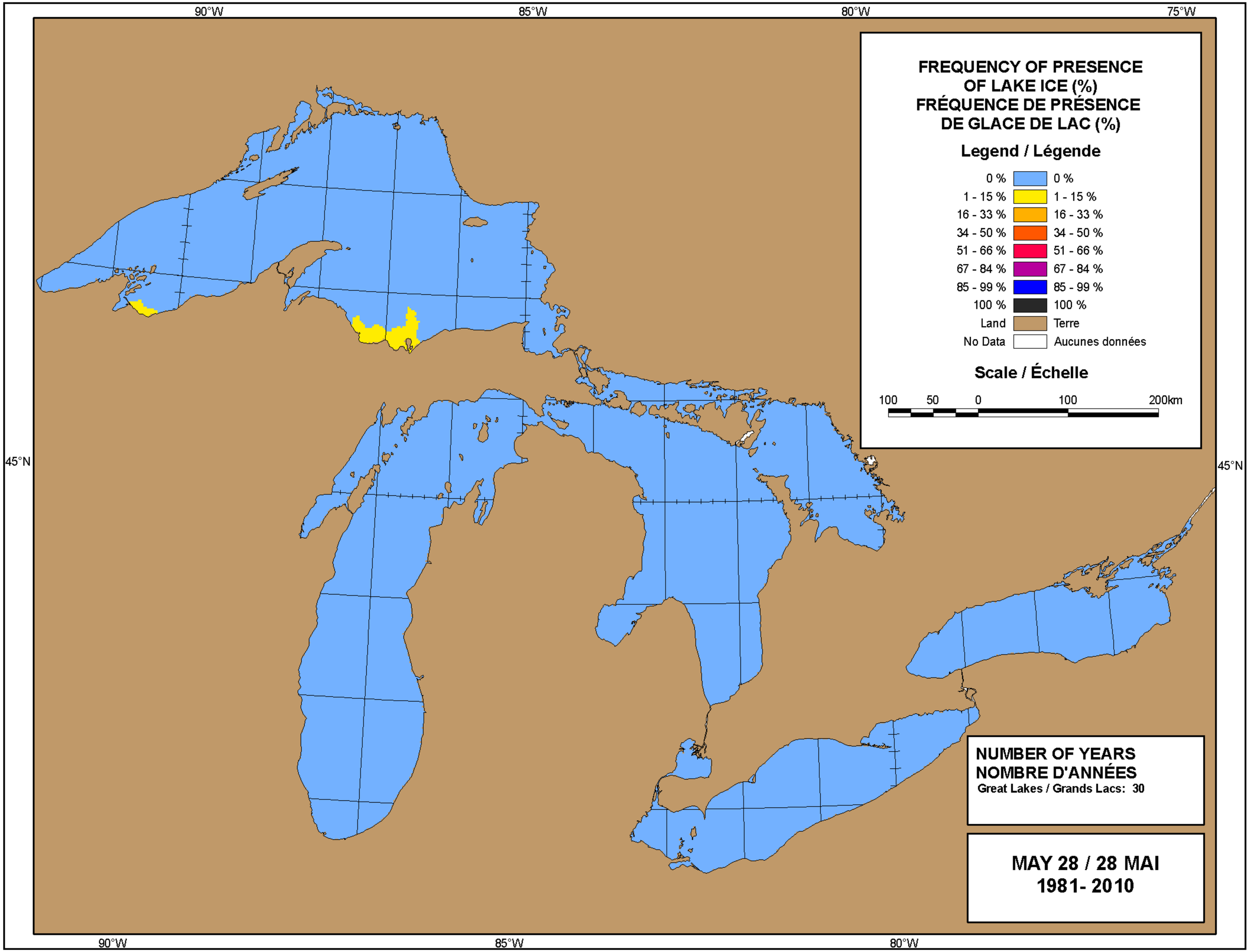

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 23 / 23 AVR
1981- 2010

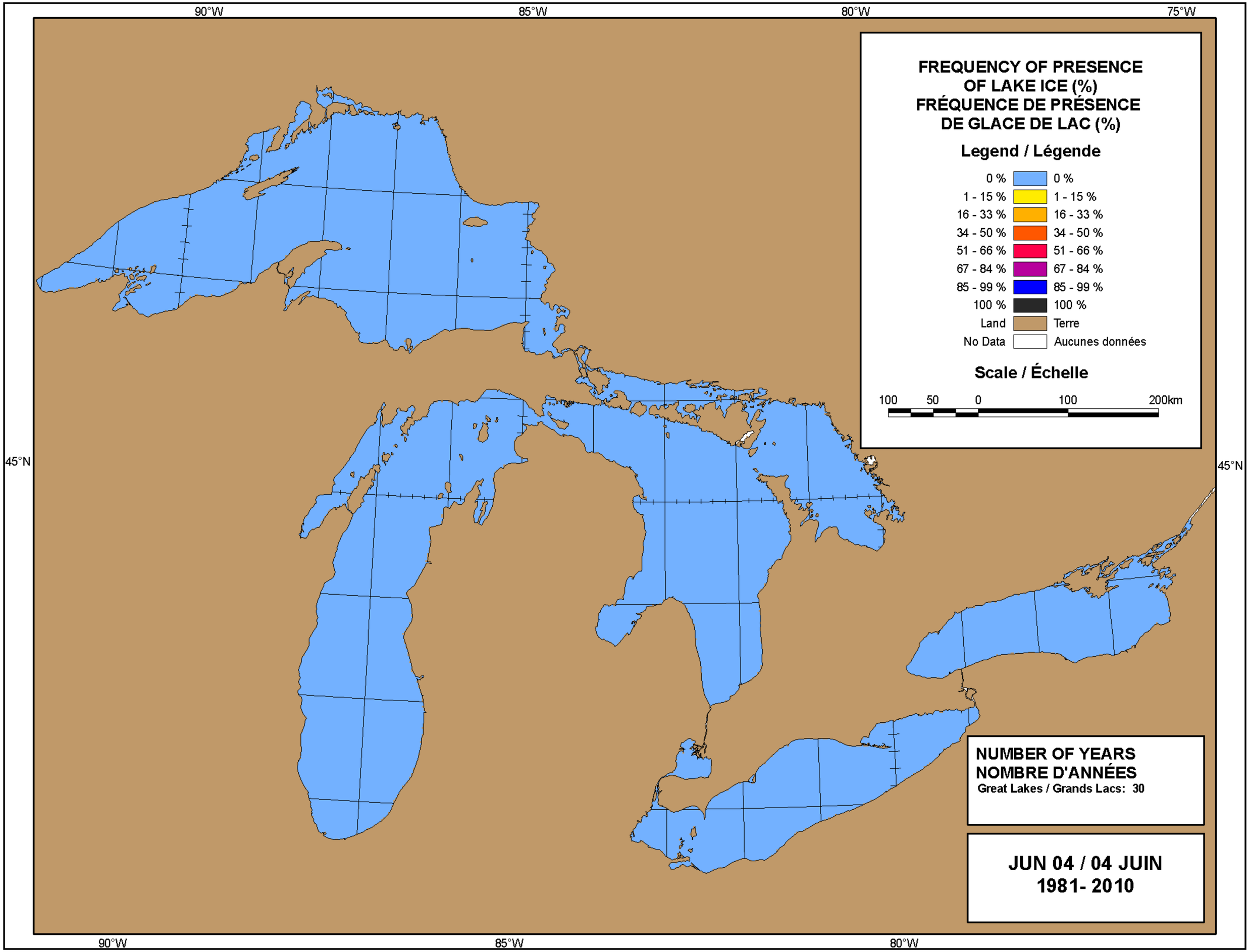

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 30 / 30 AVR
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 07 / 07 MAI
1981- 2010

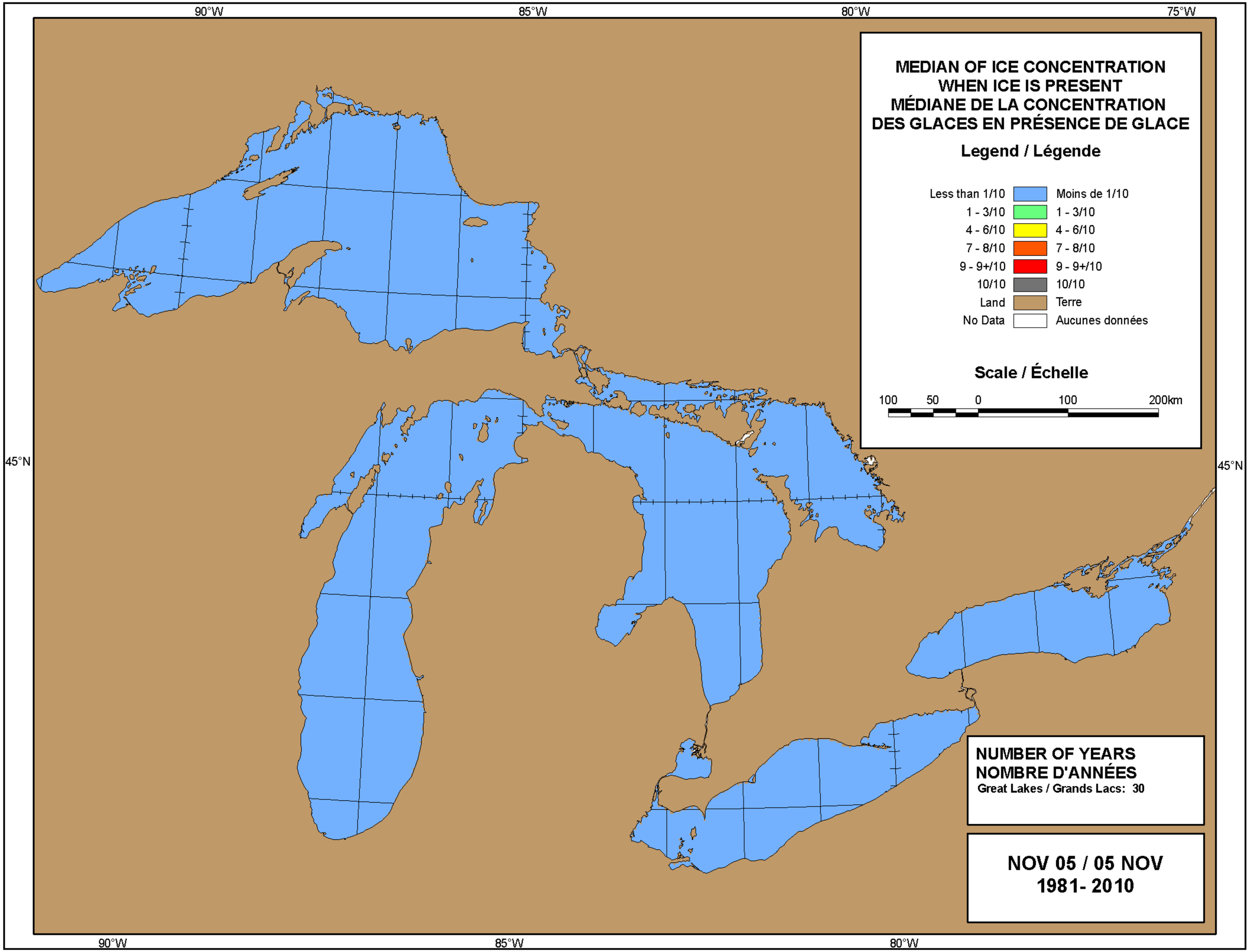

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 14 / 14 MAI
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 21 / 21 MAI
1981- 2010

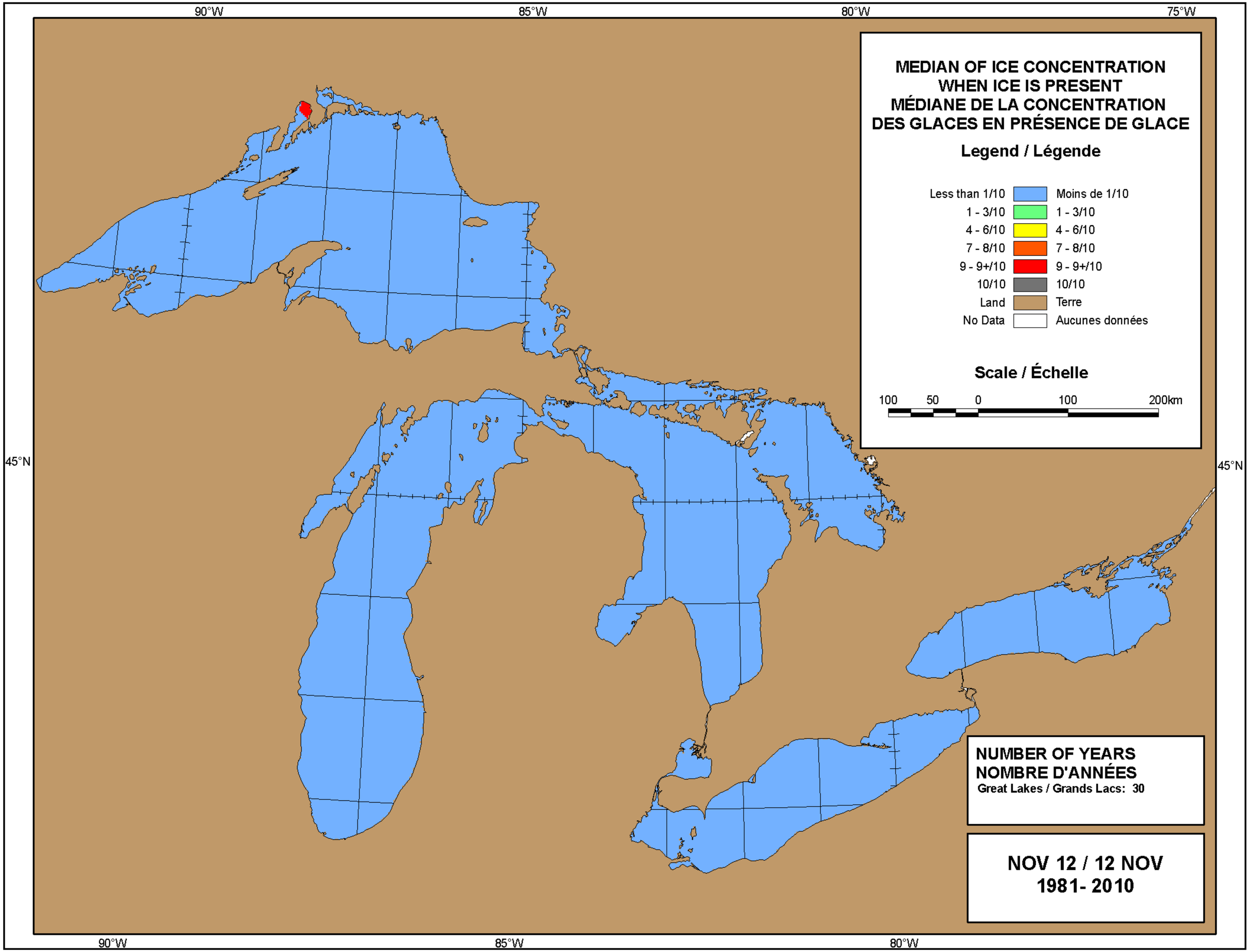

90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 28 / 28 MAI
1981- 2010


90°W
85°W
80°W
75°W
45°N
FREQUENCY OF PRESENCE OF LAKE ICE (%)
FRÉQUENCE DE PRÉSENCE DE GLACE DE LAC (%)
Legend / Légende
0 % 0 %
1 - 15 % 1 - 15 %
16 - 33 % 16 - 33 %
34 - 50 % 34 - 50 %
51 - 66 % 51 - 66 %
67 - 84 % 67 - 84 %
85 - 99 % 85 - 99 %
100 % 100 %
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JUN 04 / 04 JUIN
1981- 2010

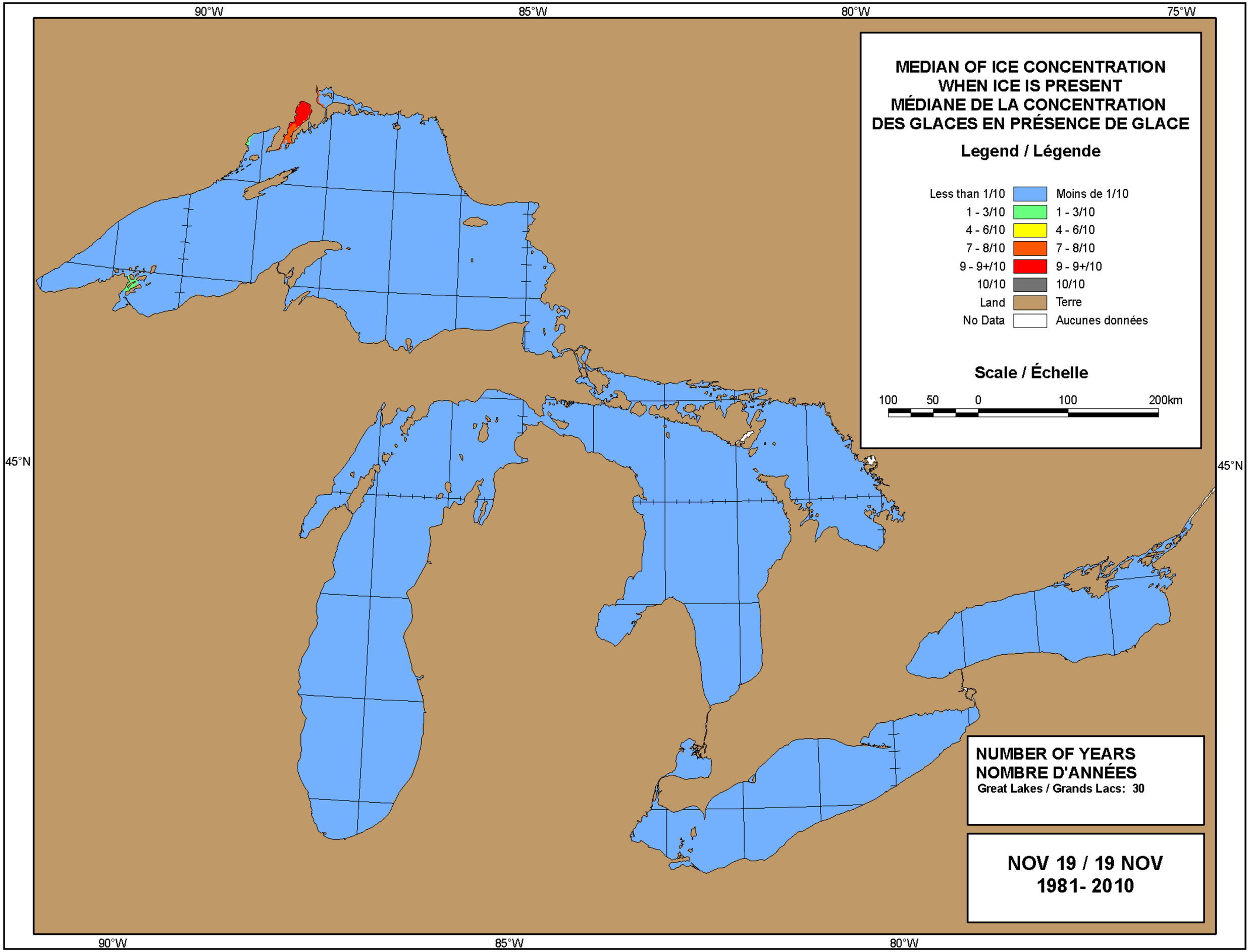
30-Year Median of Ice Concentration When Ice is Present Charts

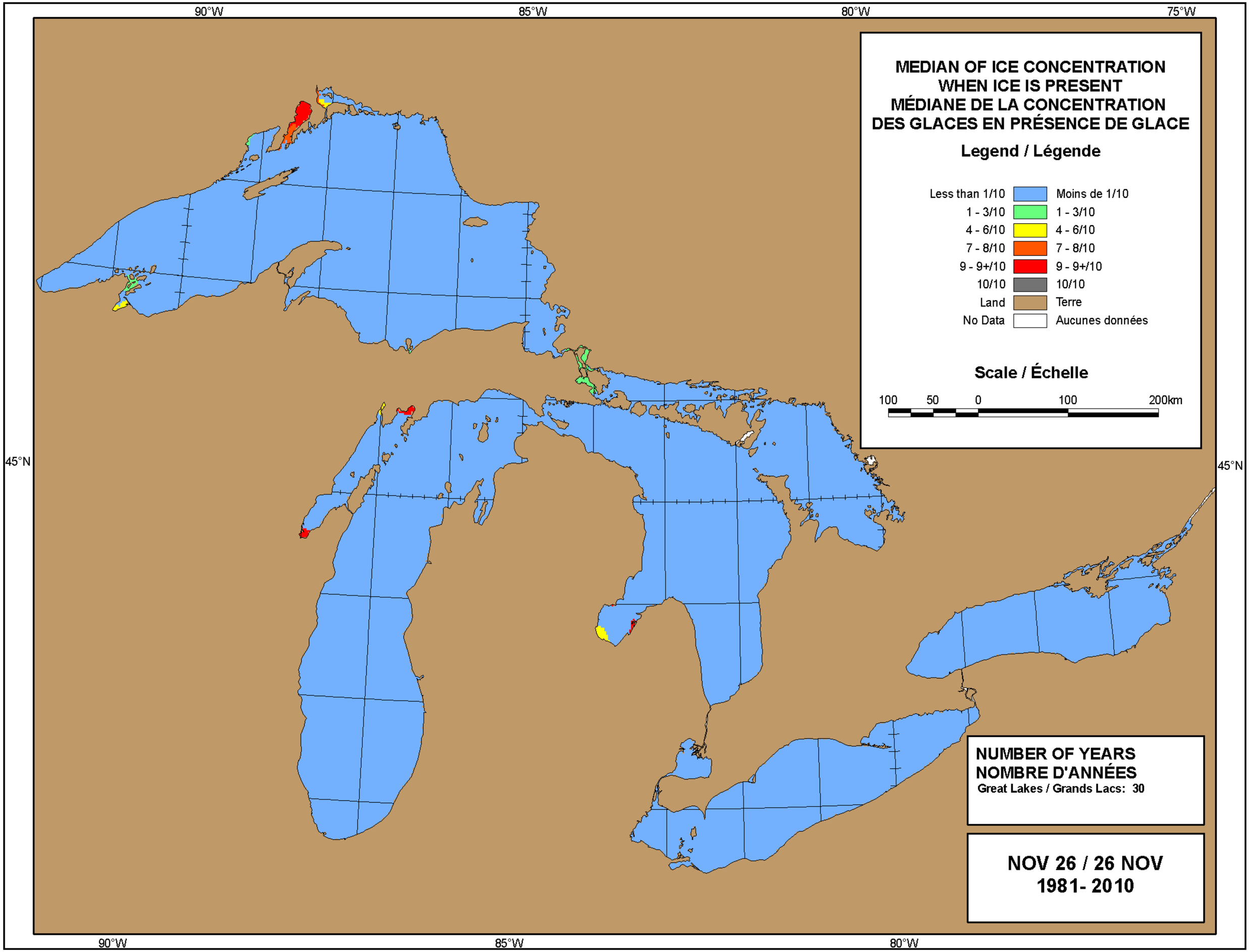

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 05 / 05 NOV
1981- 2010

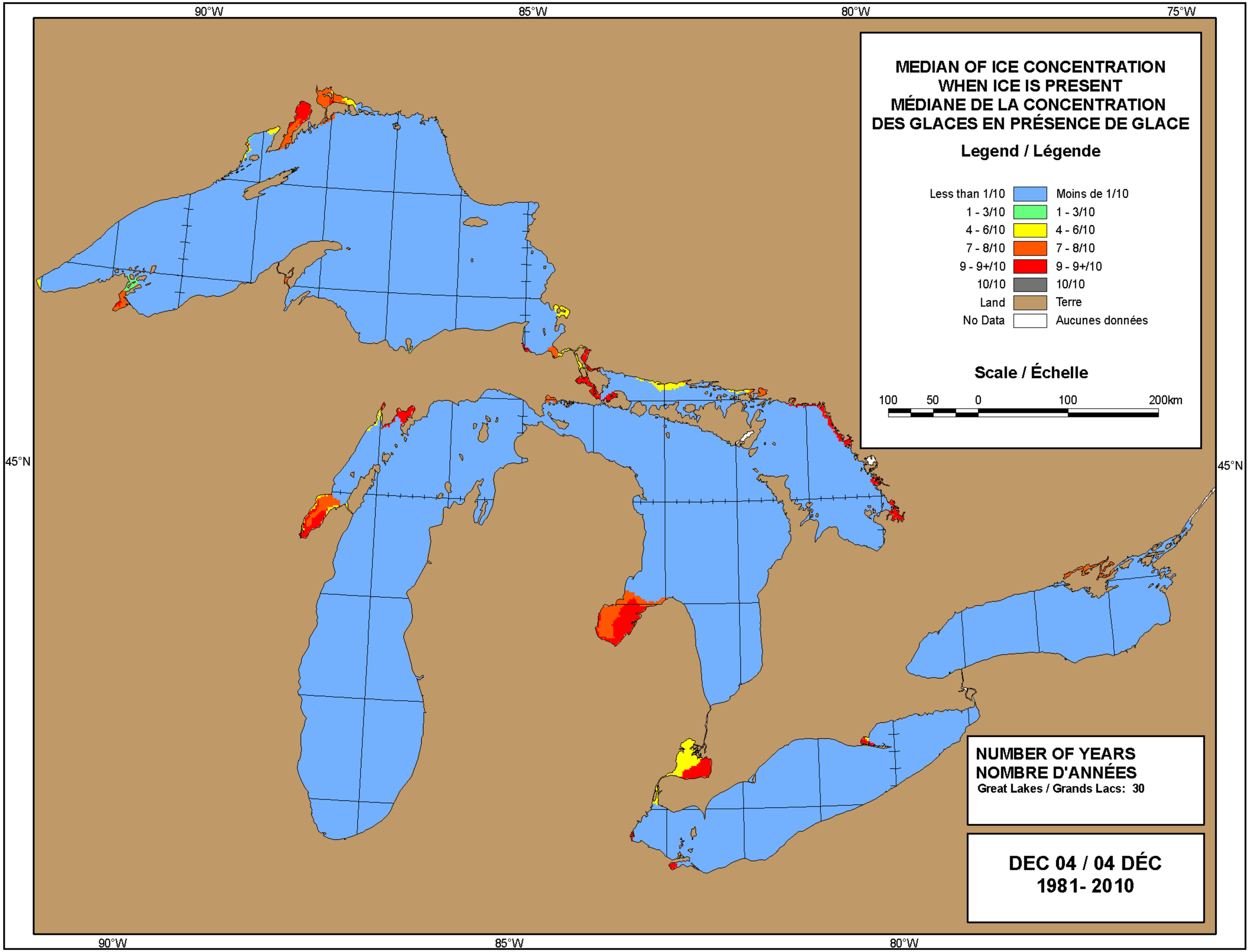
Environment Canada Environnement Canada

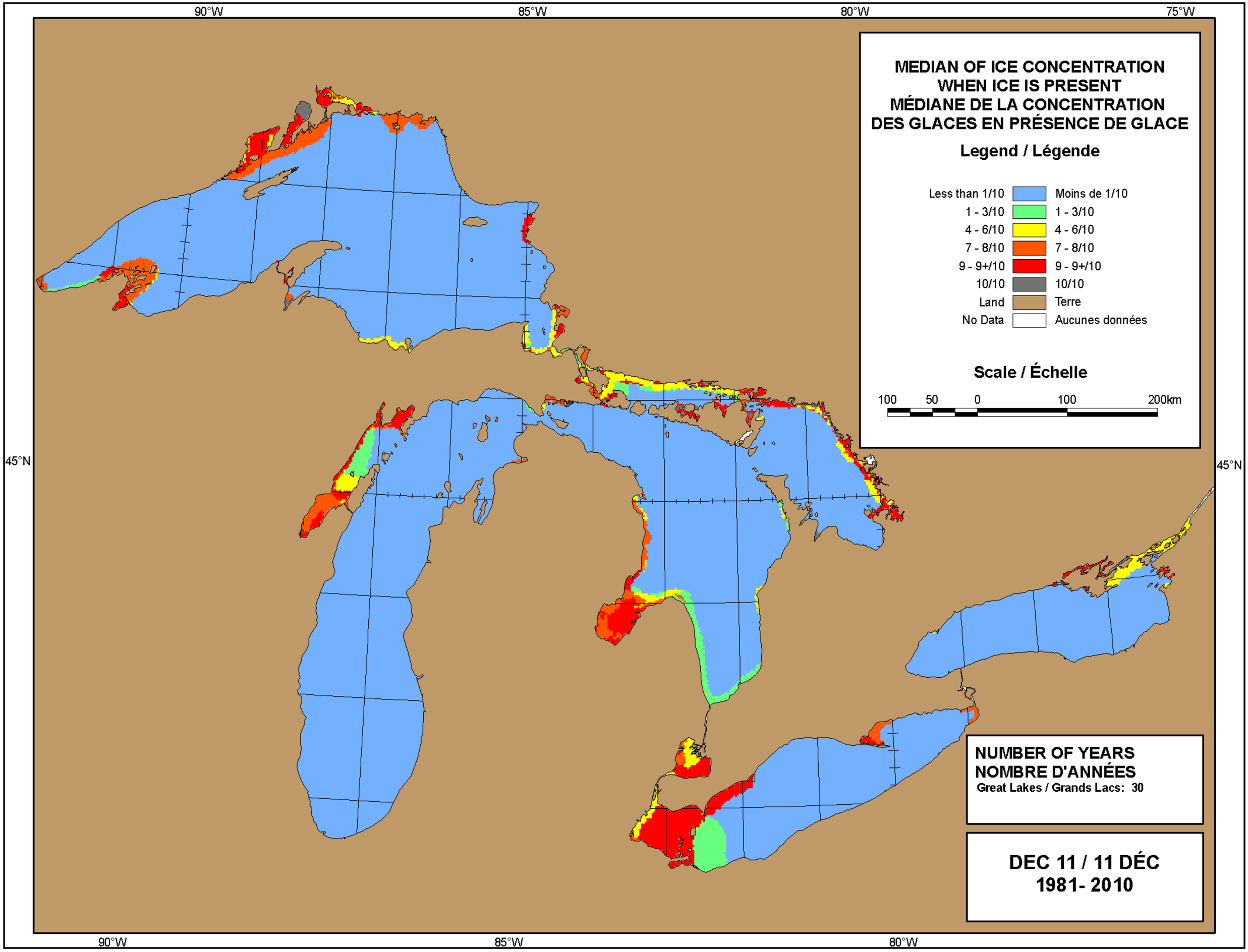


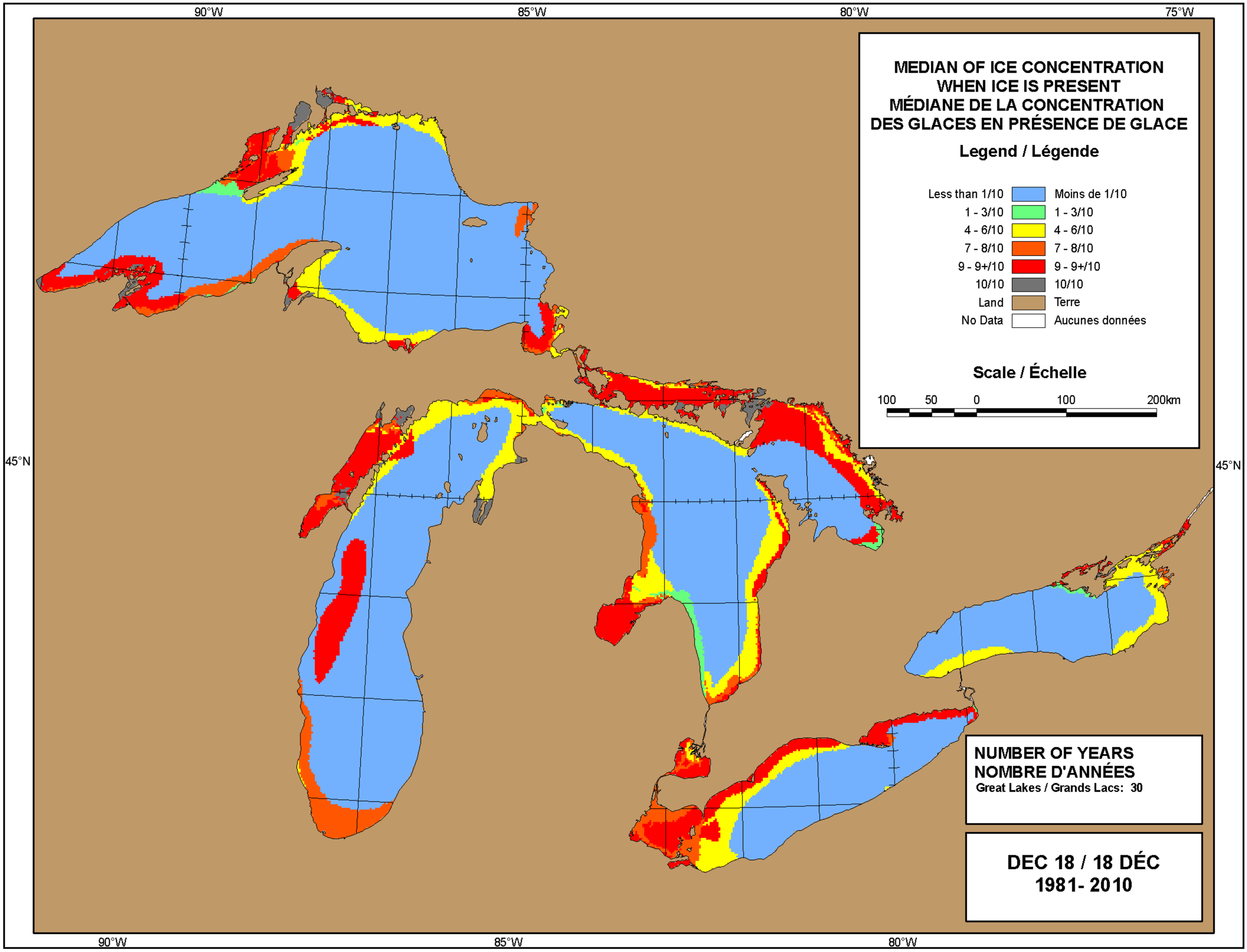
Canada

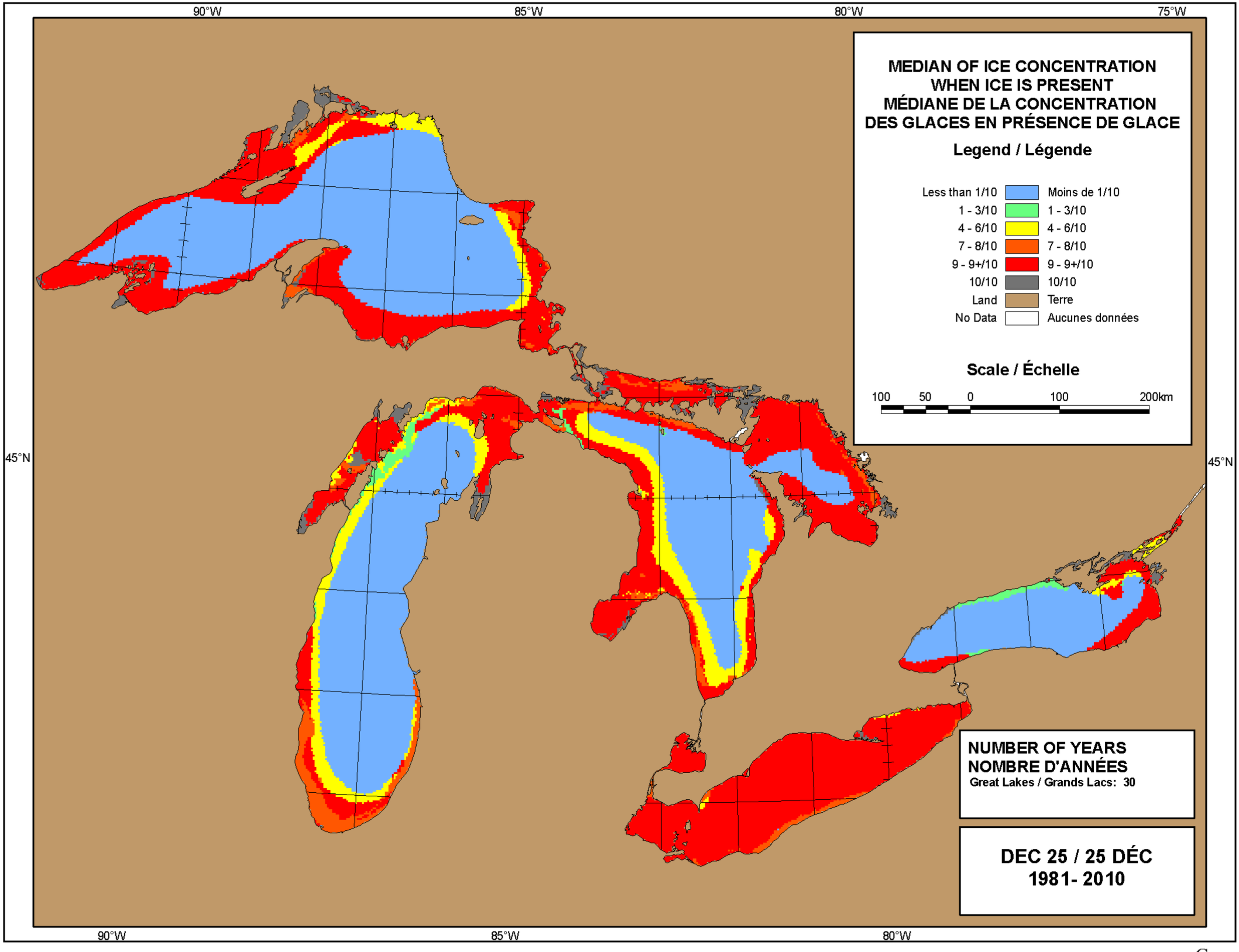

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 19 / 19 NOV
1981- 2010

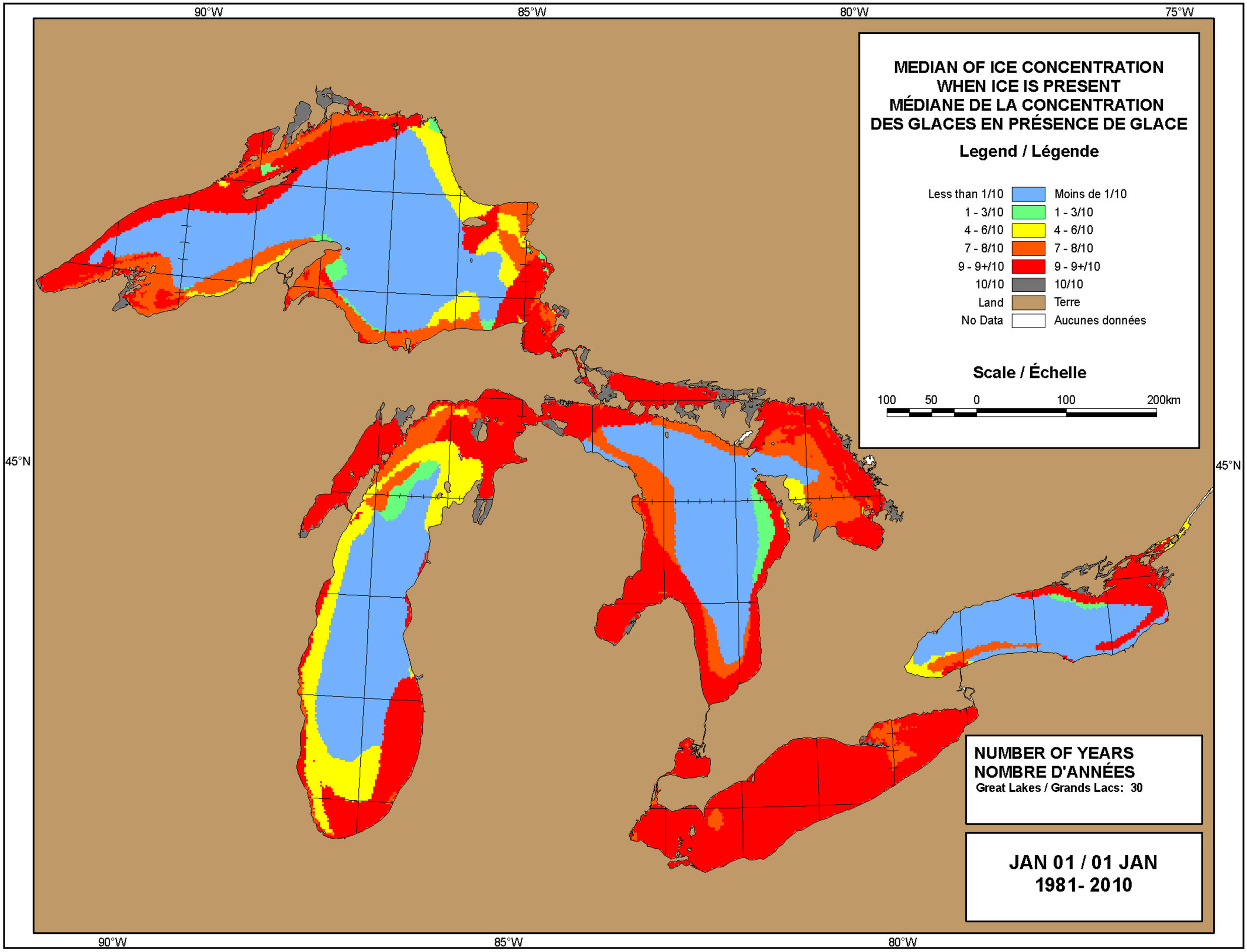

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
NOV 26 / 26 NOV
1981- 2010

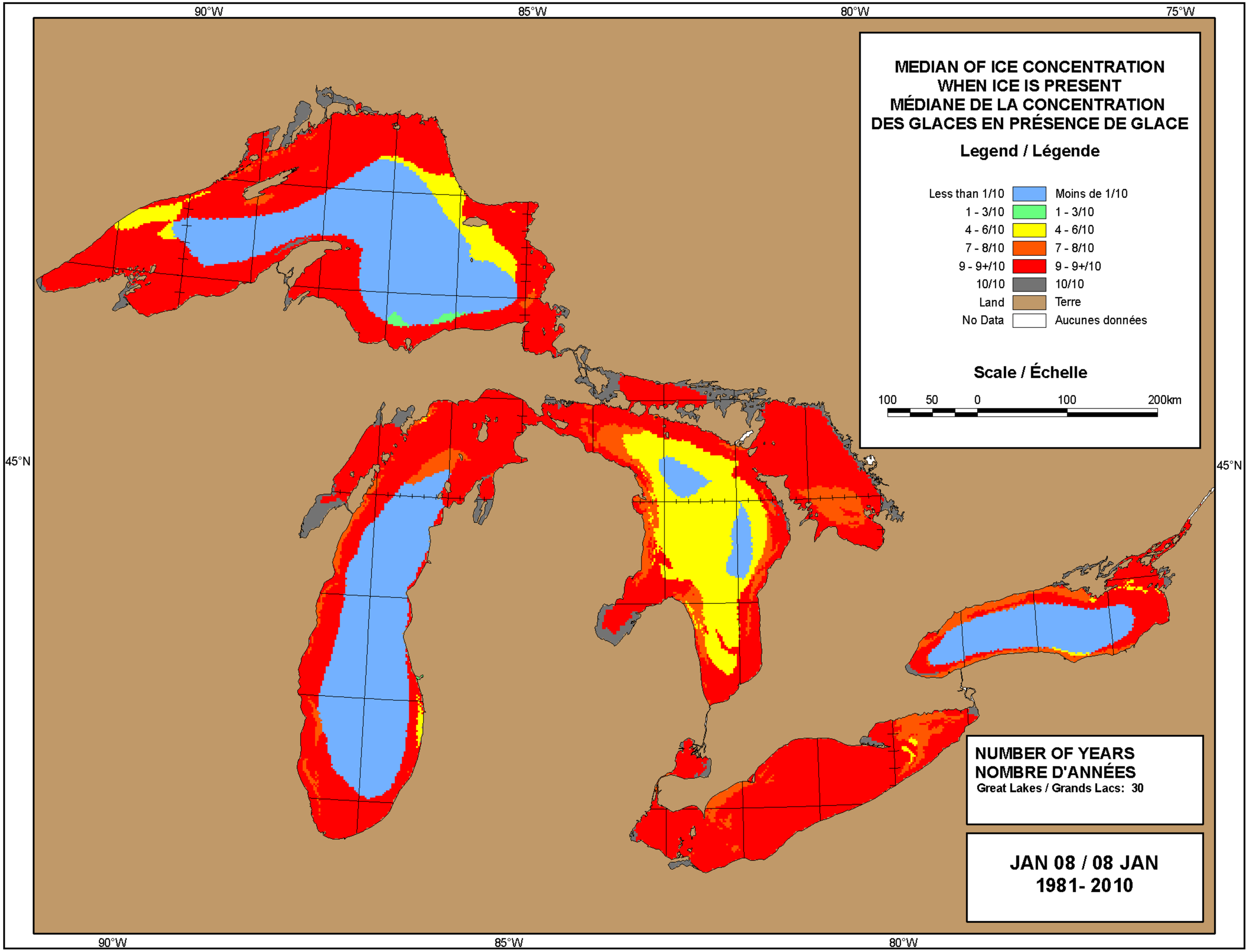

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 04 / 04 DÉC
1981- 2010

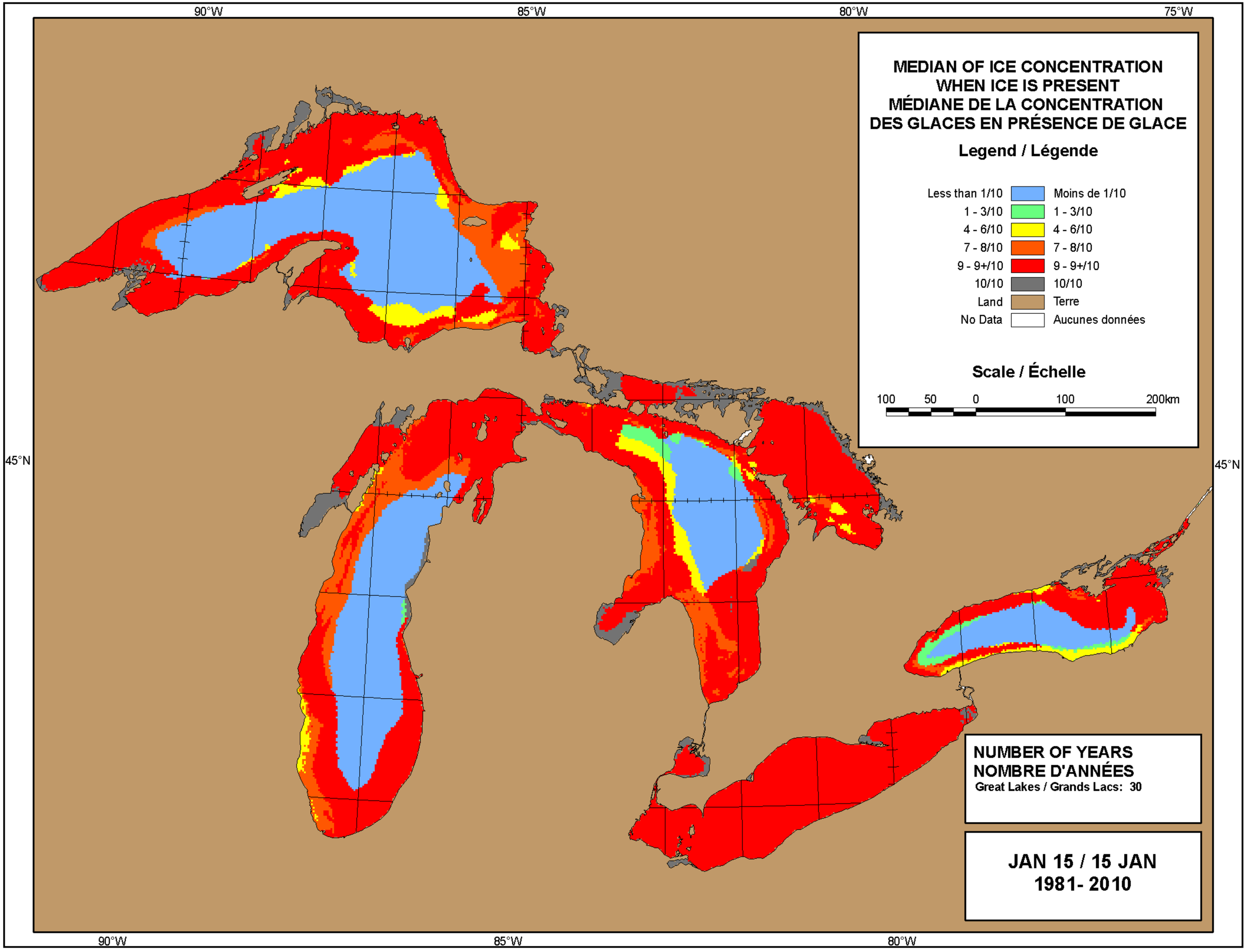

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 11 / 11 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 18 / 18 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
DEC 25 / 25 DÉC
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 01 / 01 JAN
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 08 / 08 JAN
1981- 2010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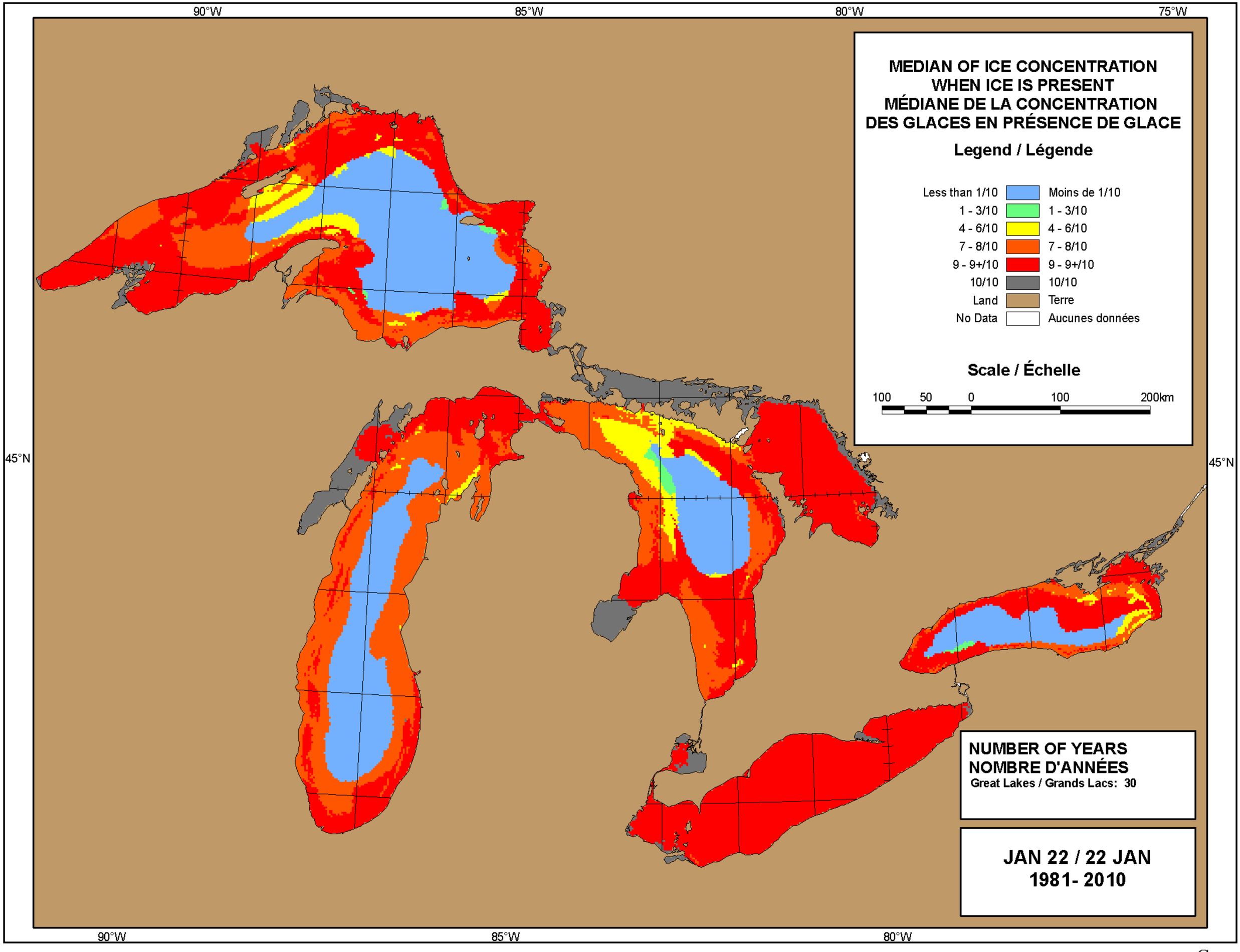
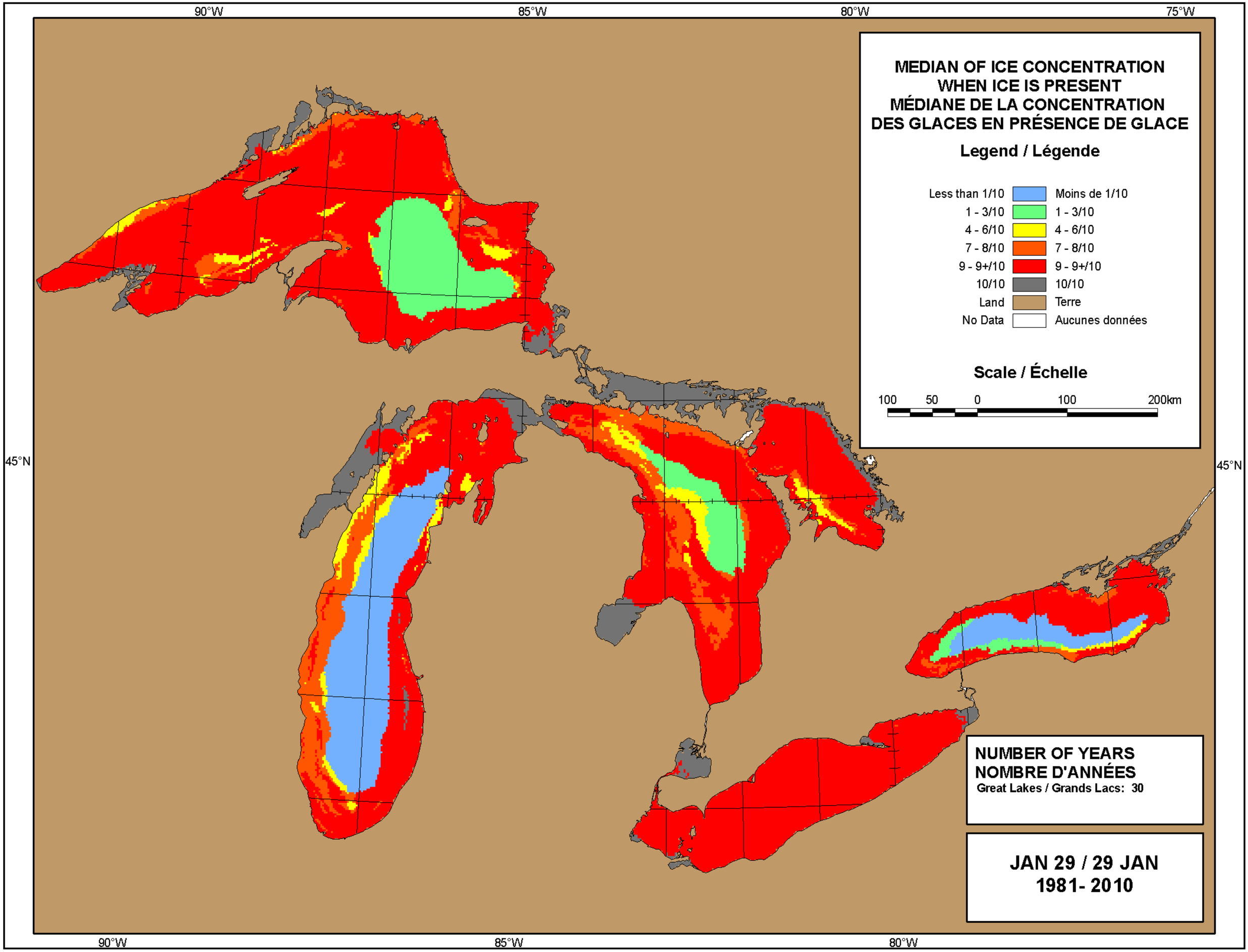
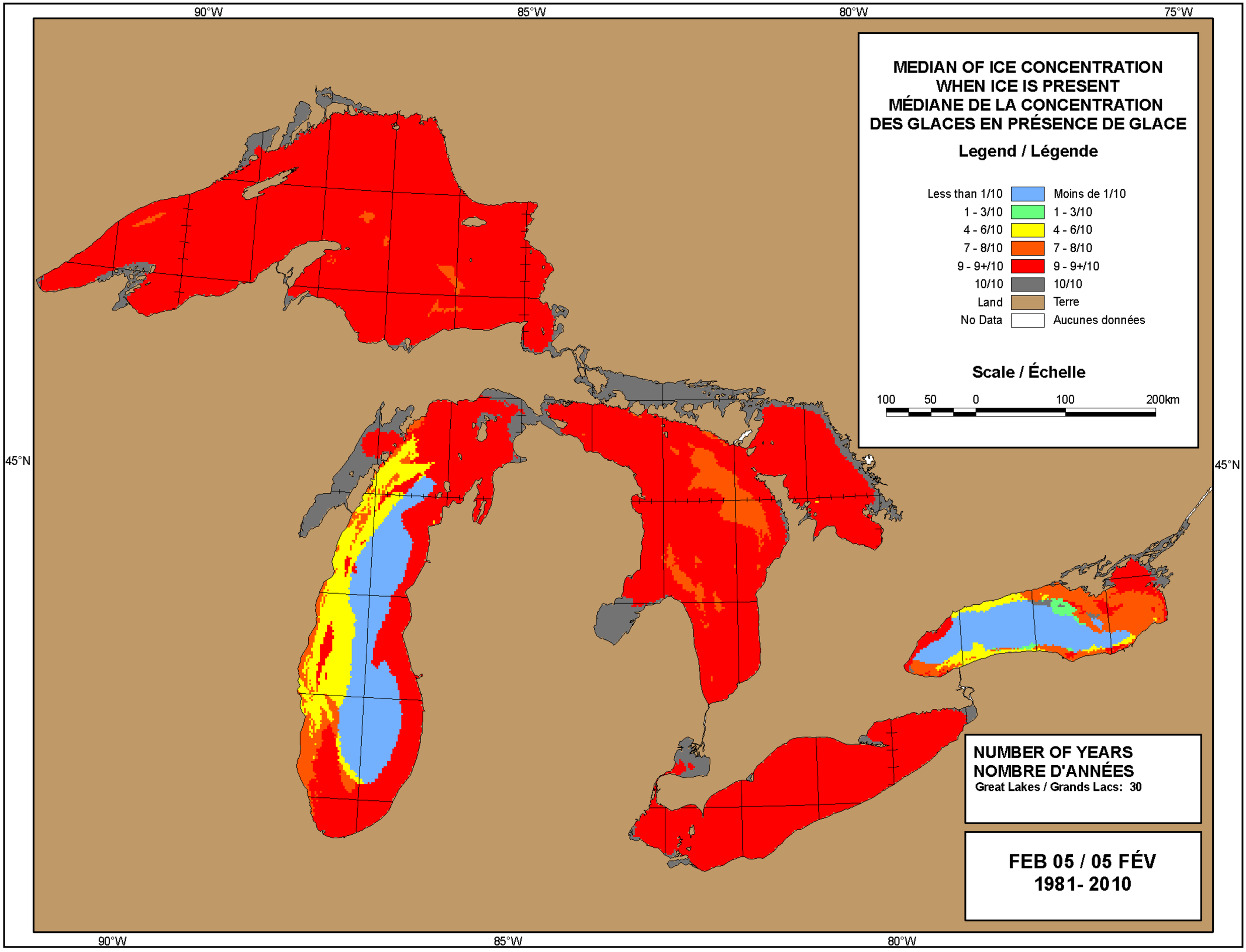
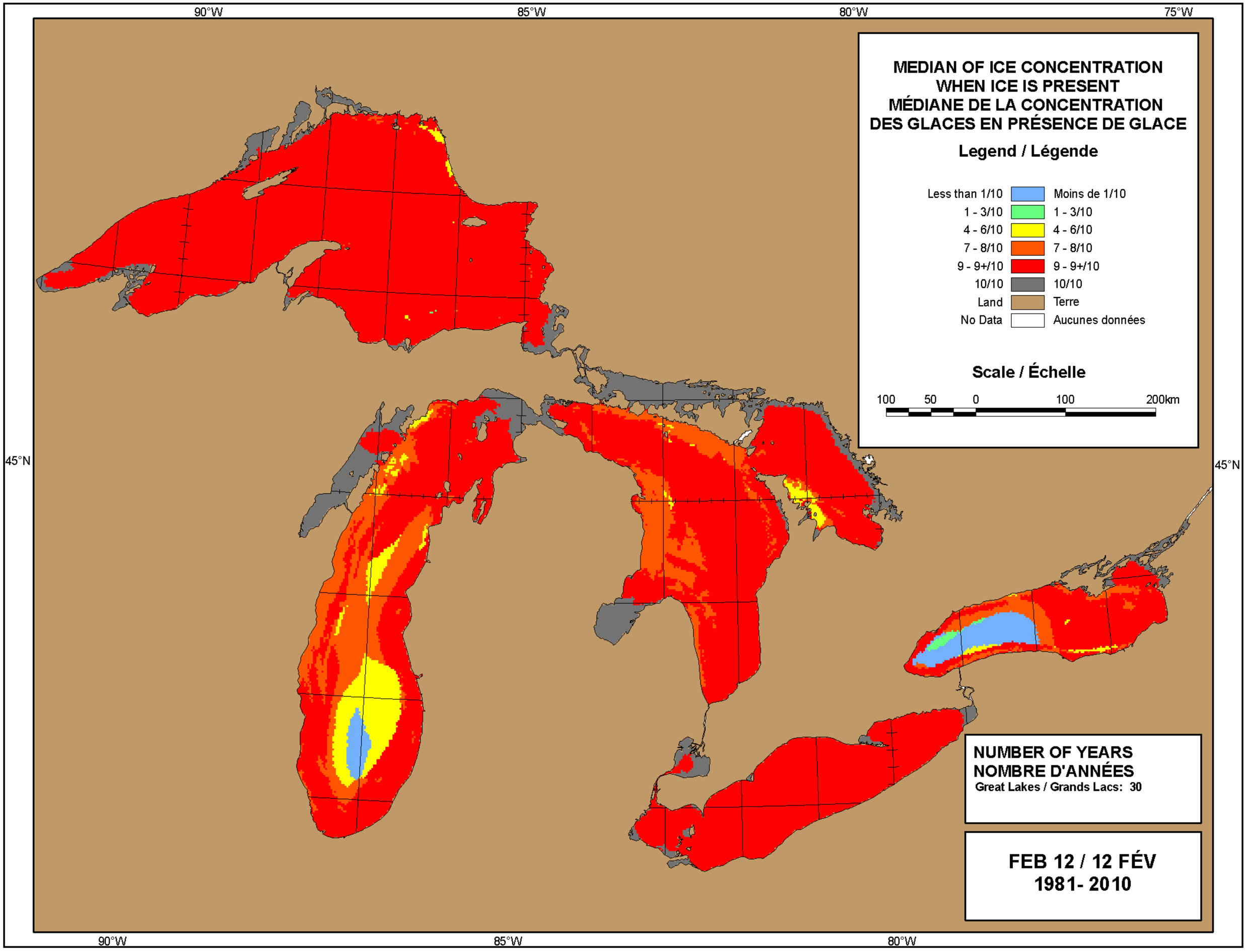
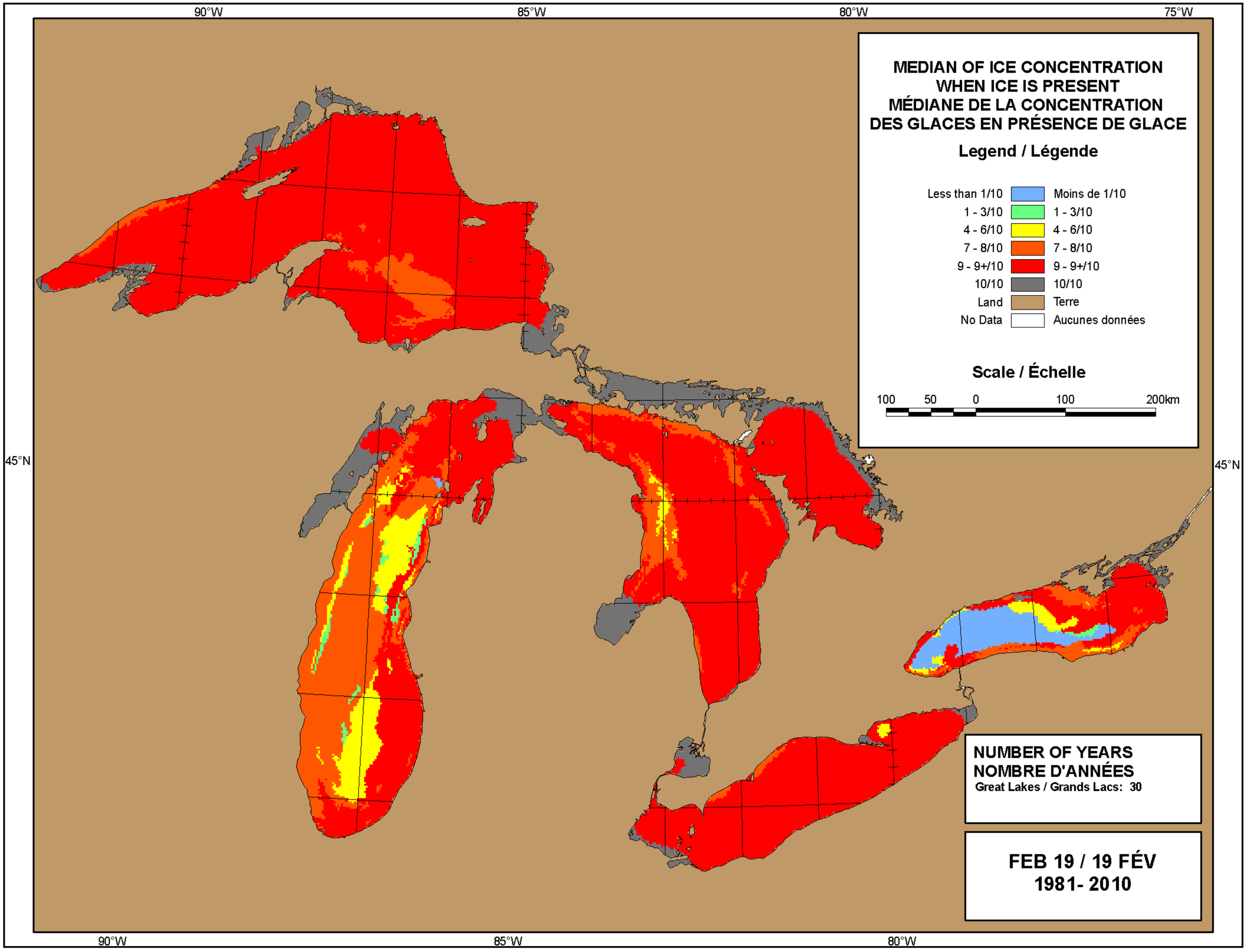
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 15 / 15 JAN
1981- 2010

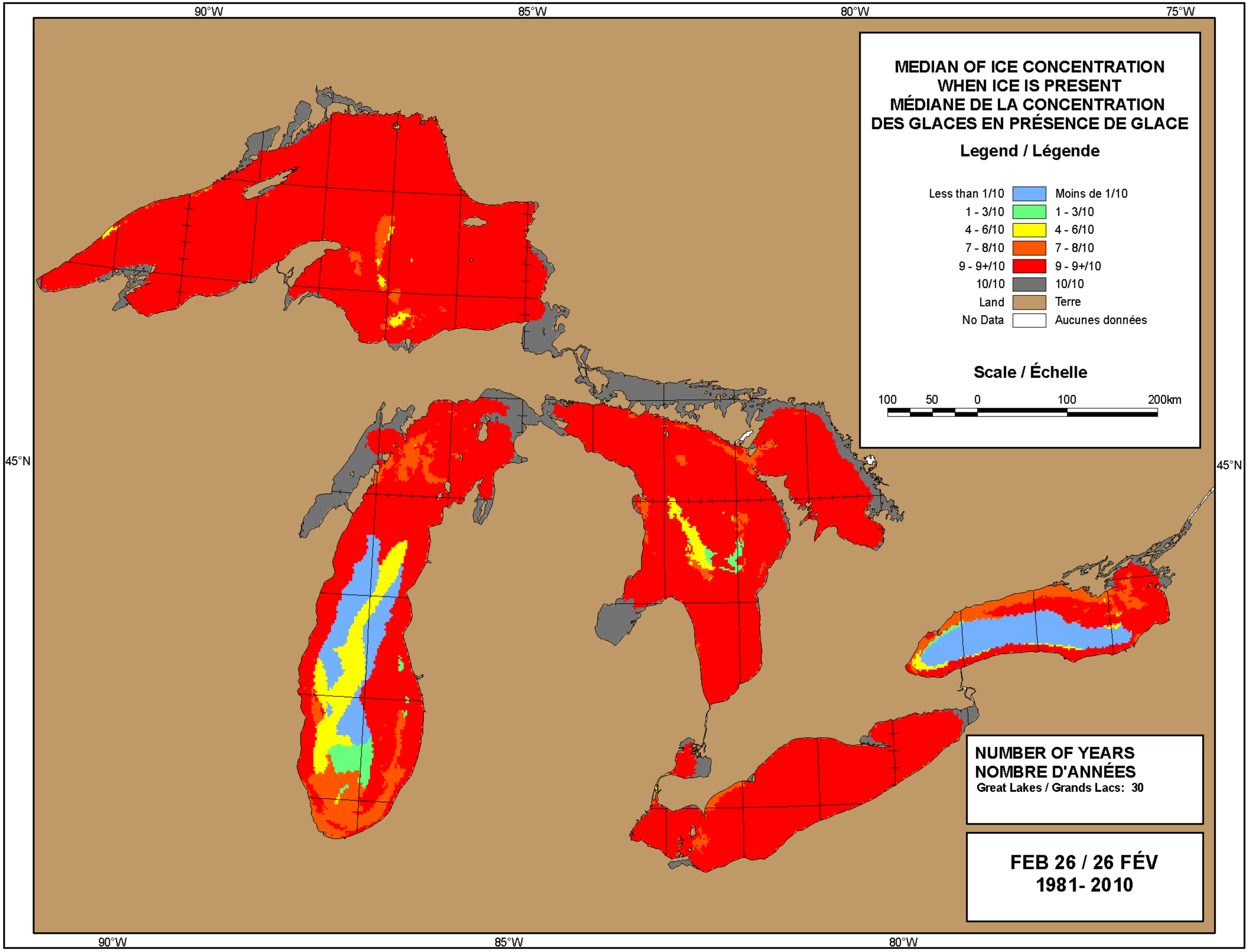

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 22 / 22 JAN
1981- 2010

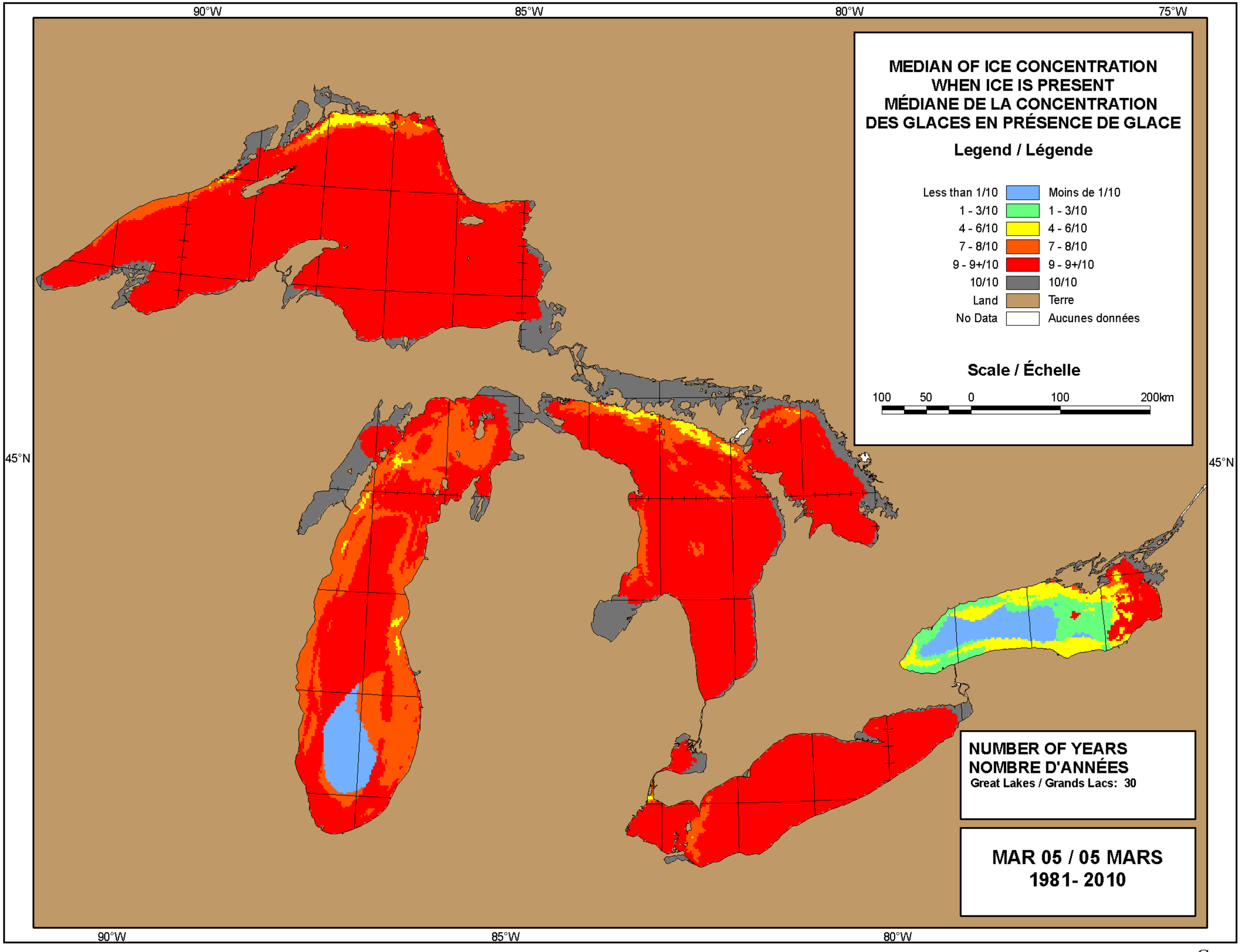

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
JAN 29 / 29 JAN
1981- 2010

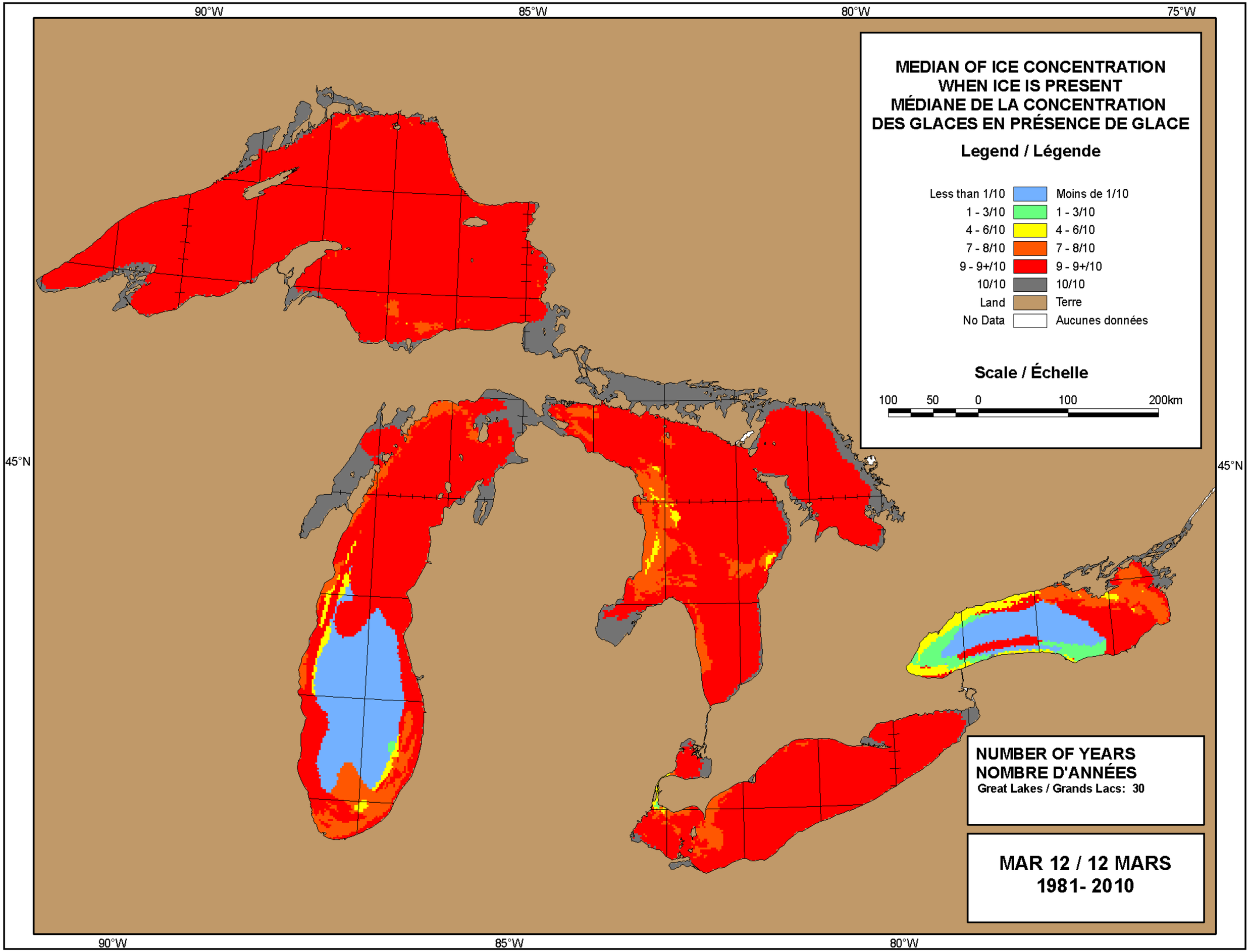

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 05 / 05 FÉV
1981- 2010

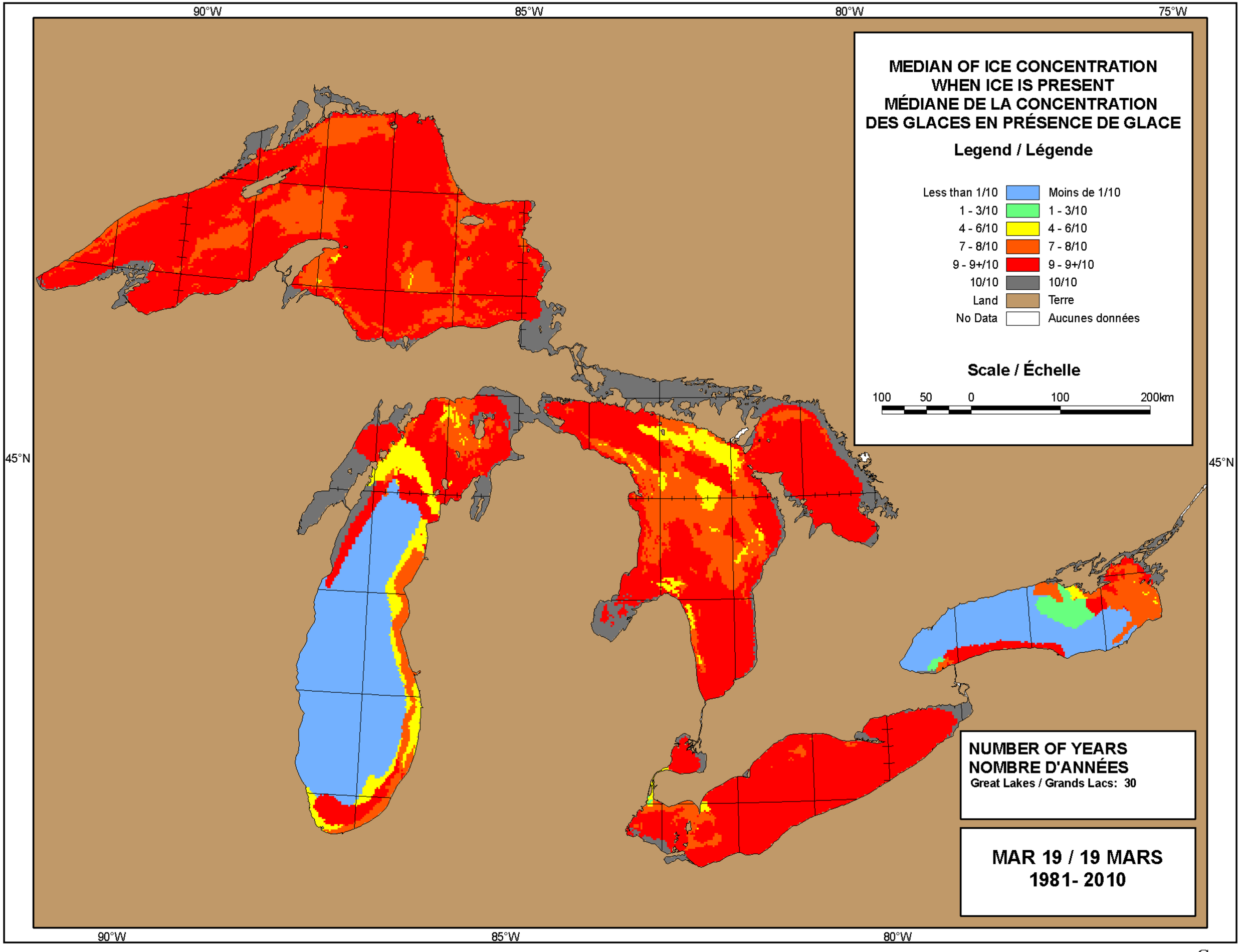

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 12 / 12 FÉV
1981- 2010

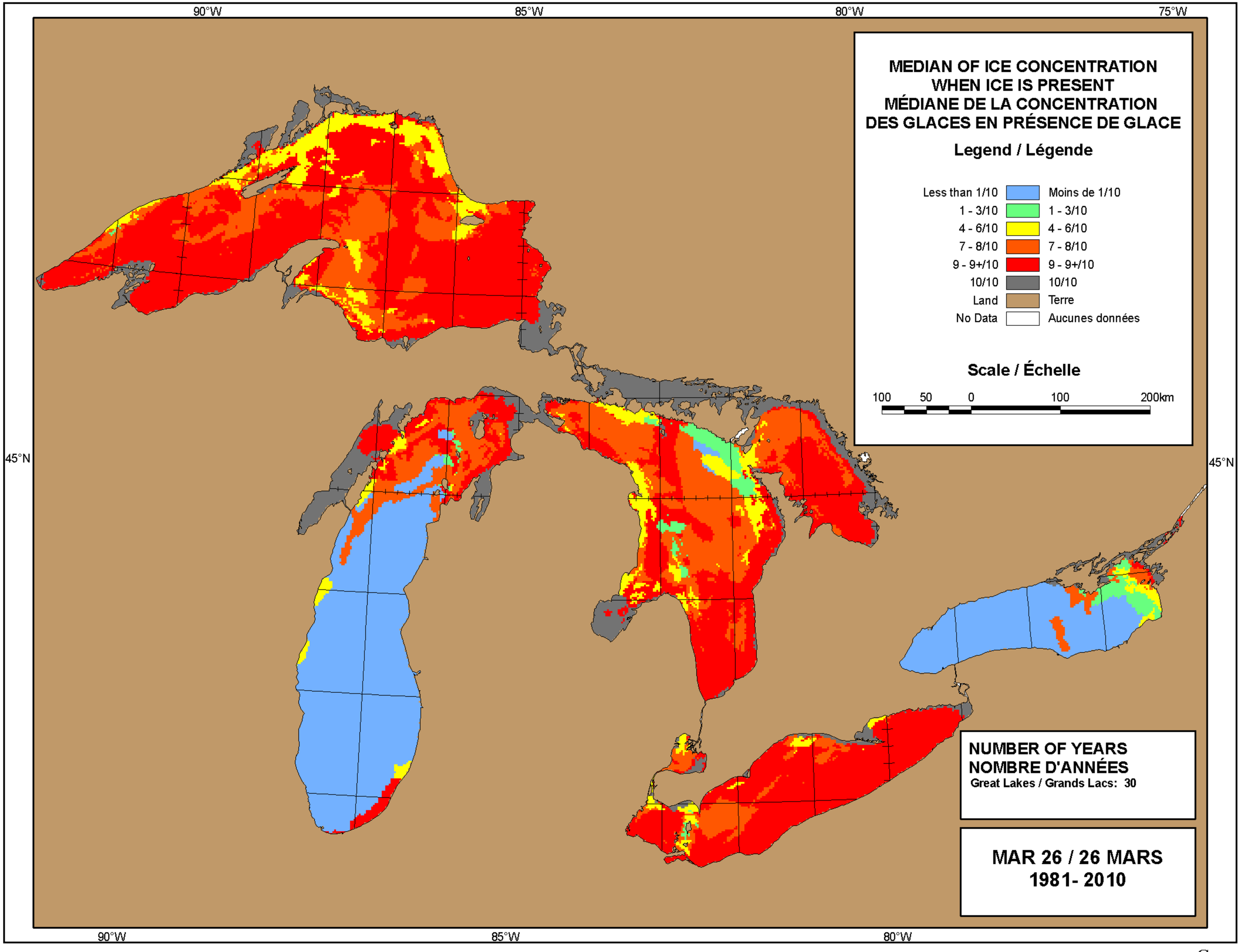

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 19 / 19 FÉV
1981- 2010

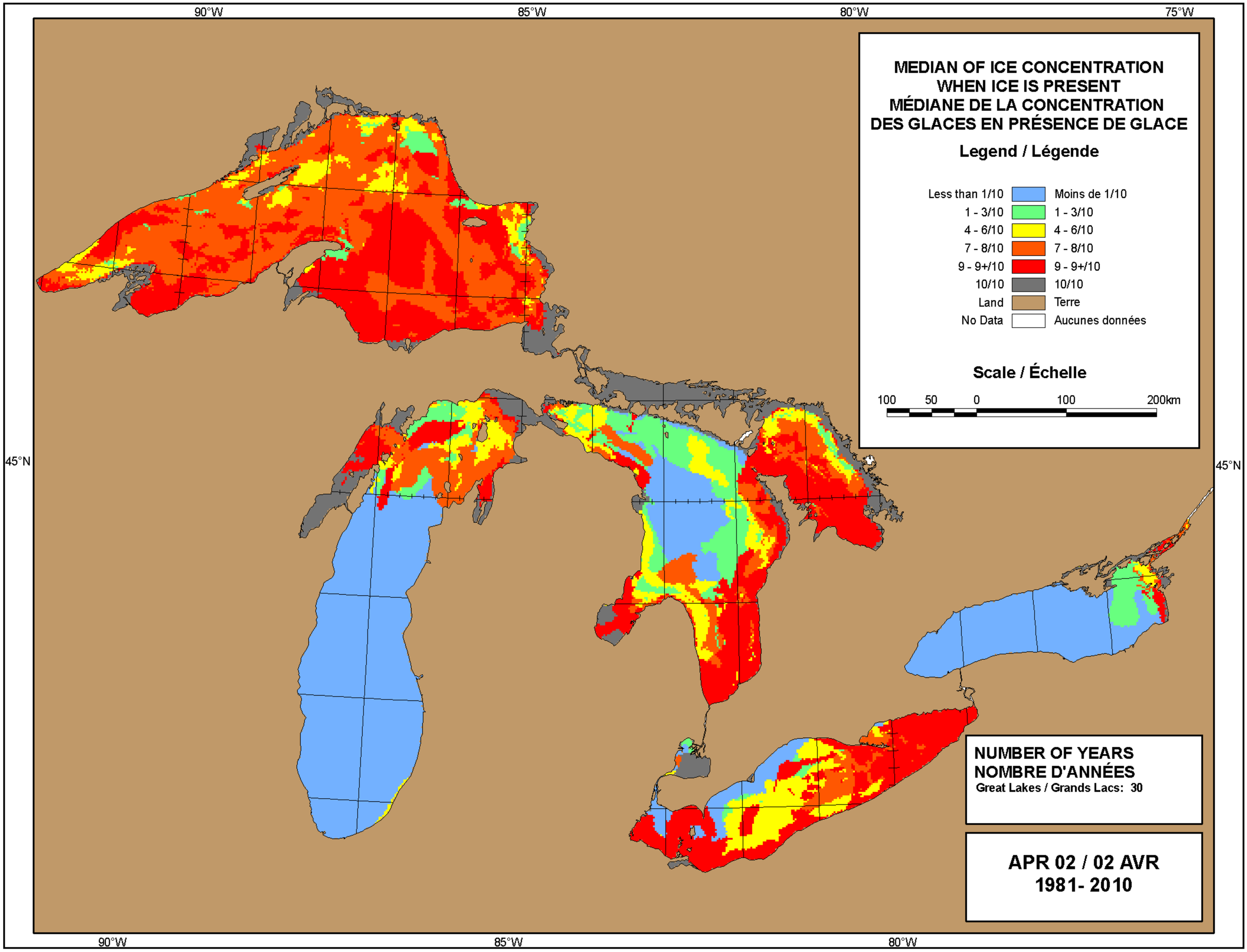

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
FEB 26 / 26 FÉV
1981- 2010

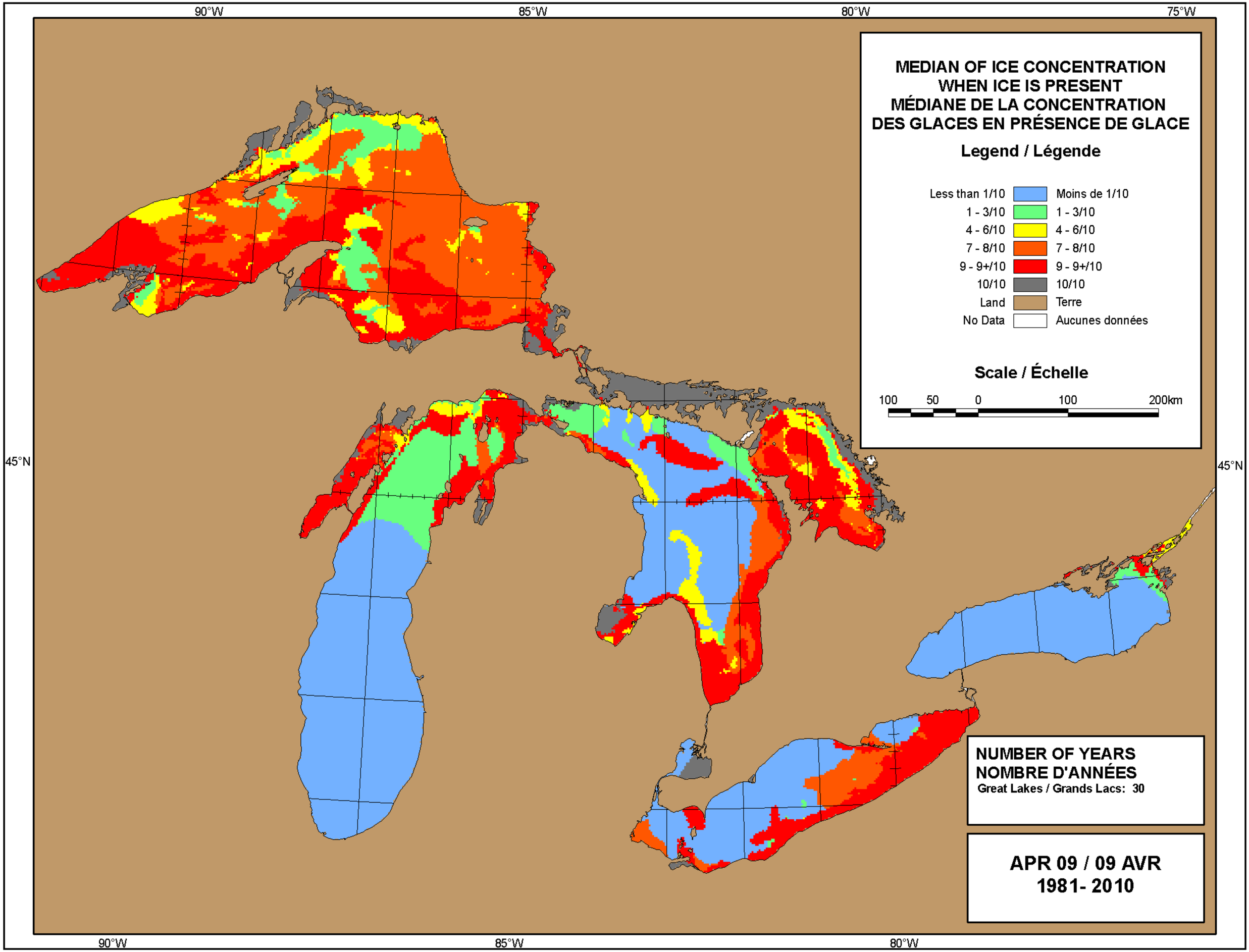

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 05 / 05 MARS
1981- 2010

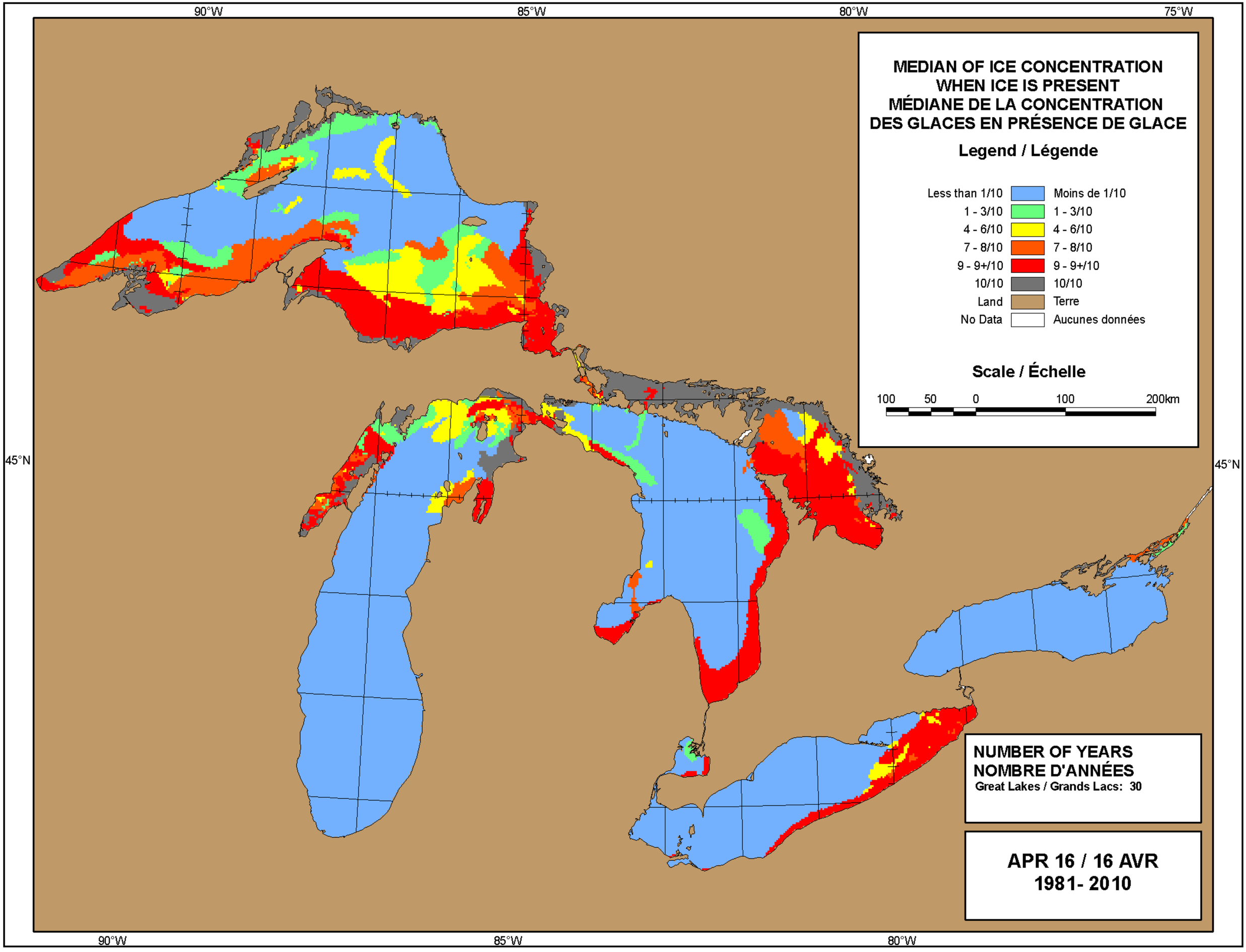

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 12 / 12 MARS
1981- 2010

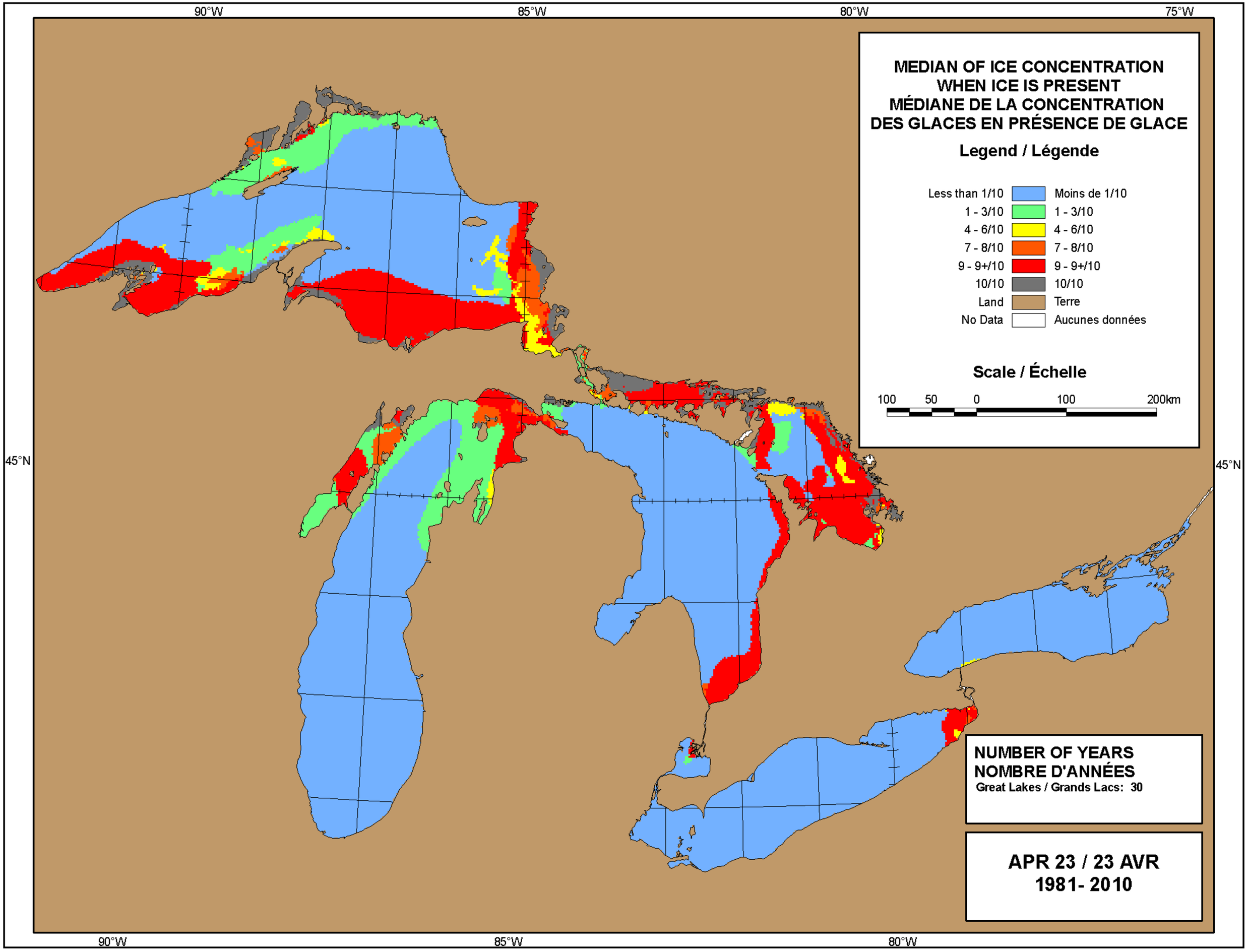

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 19 / 19 MARS
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAR 26 / 26 MARS
1981- 2010

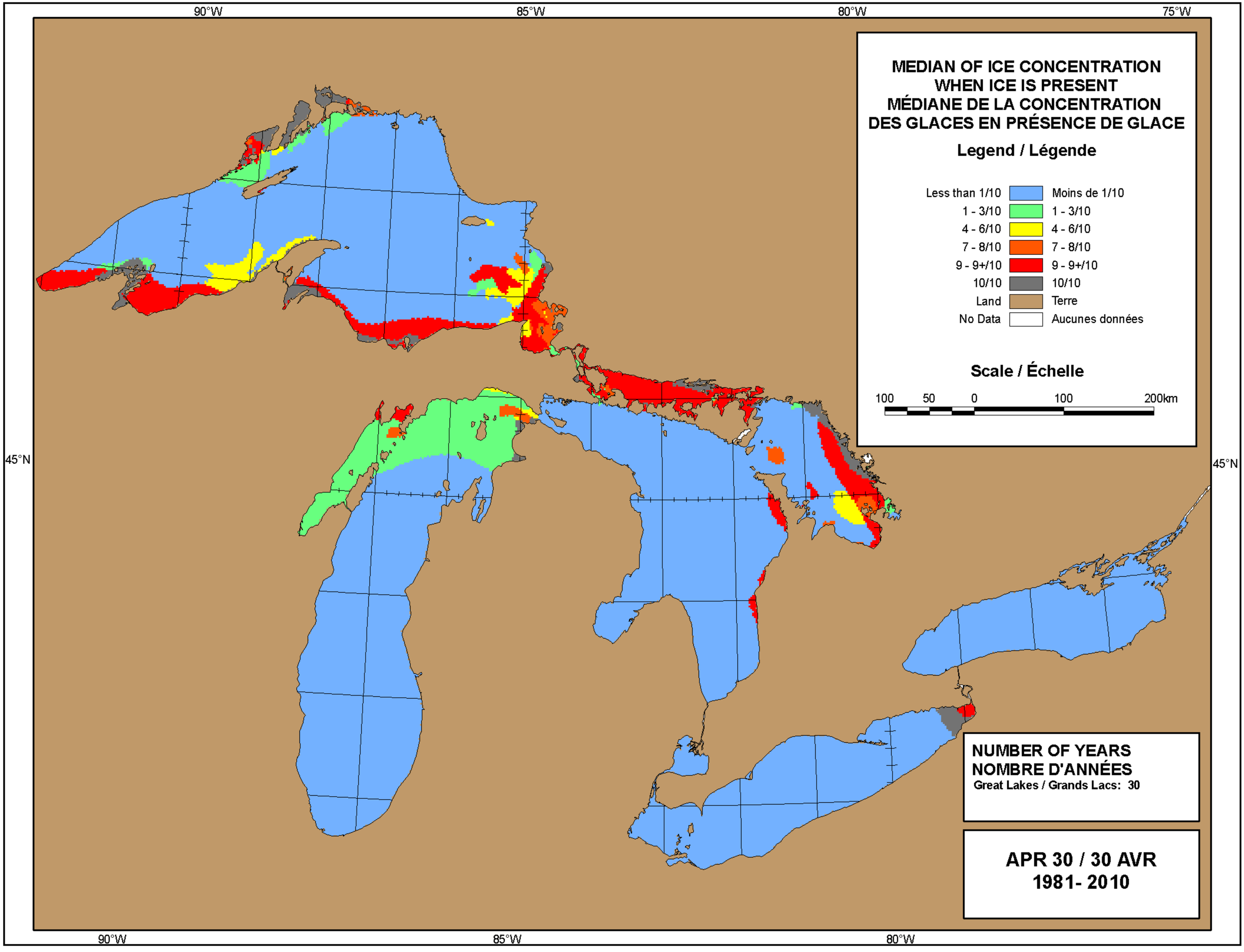

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 02 / 02 AVR
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 09 / 09 AVR
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 16 / 16 AVR
1981- 2010

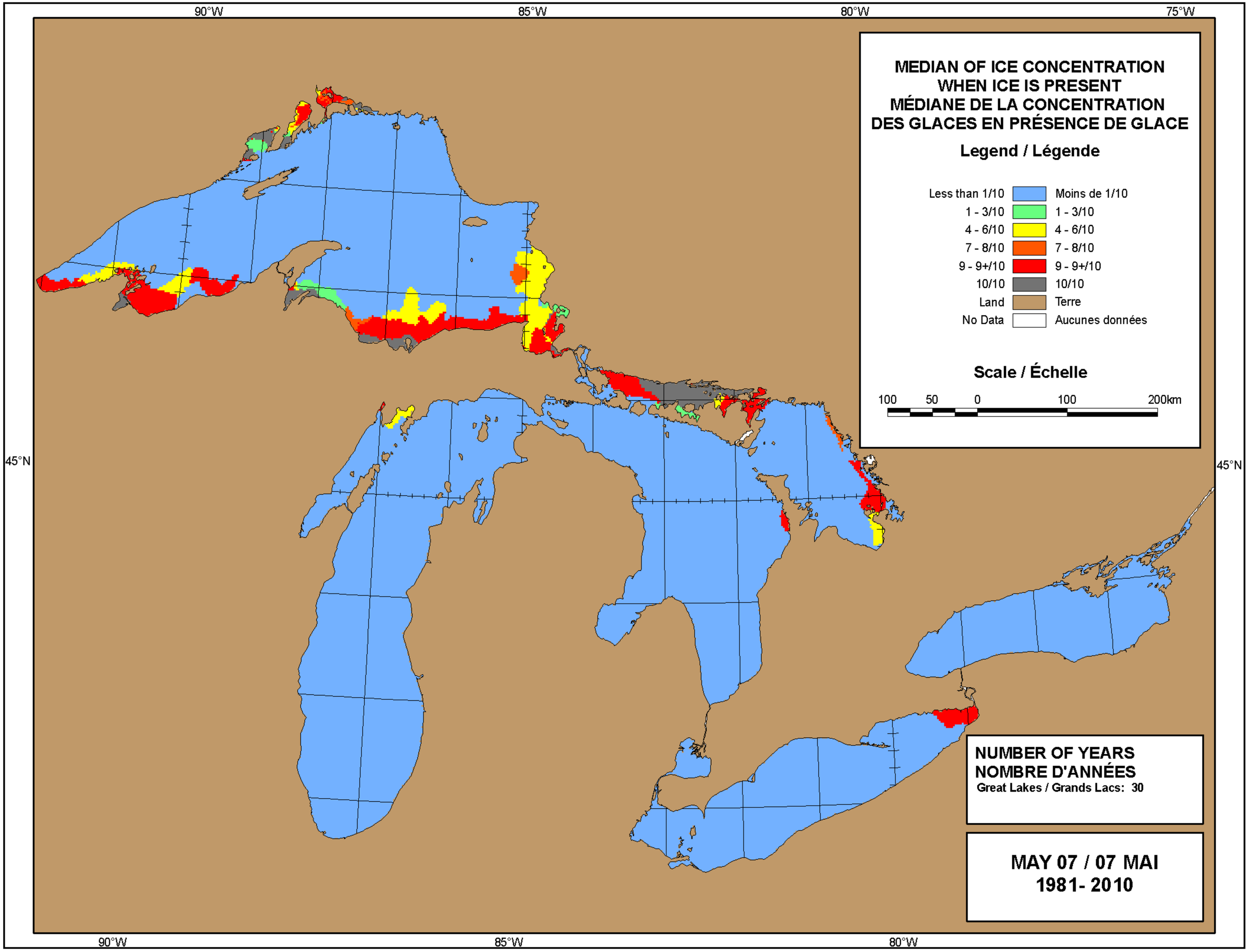

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
APR 23 / 23 AVR
1981- 2010

Environment Canada Environnement Canada

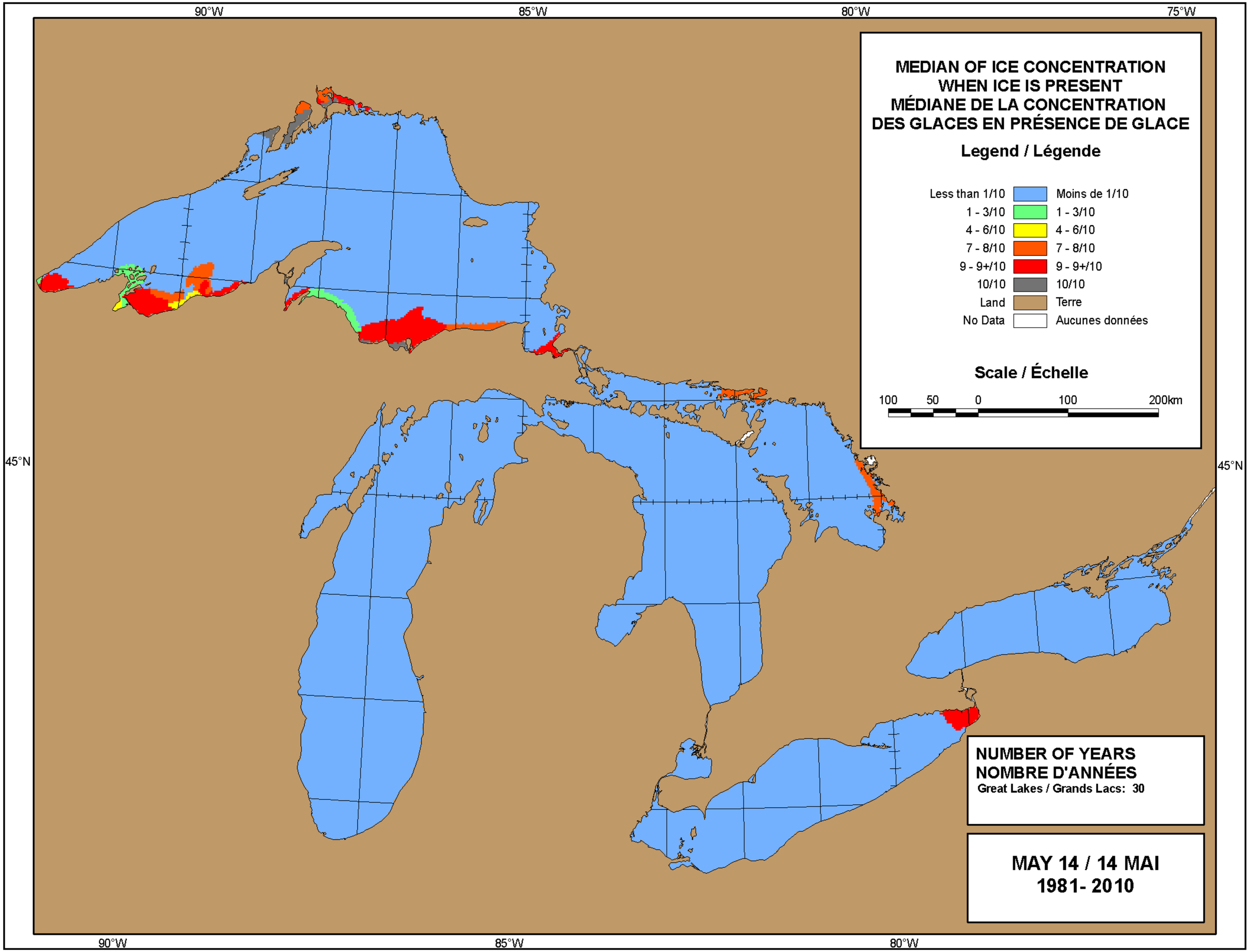


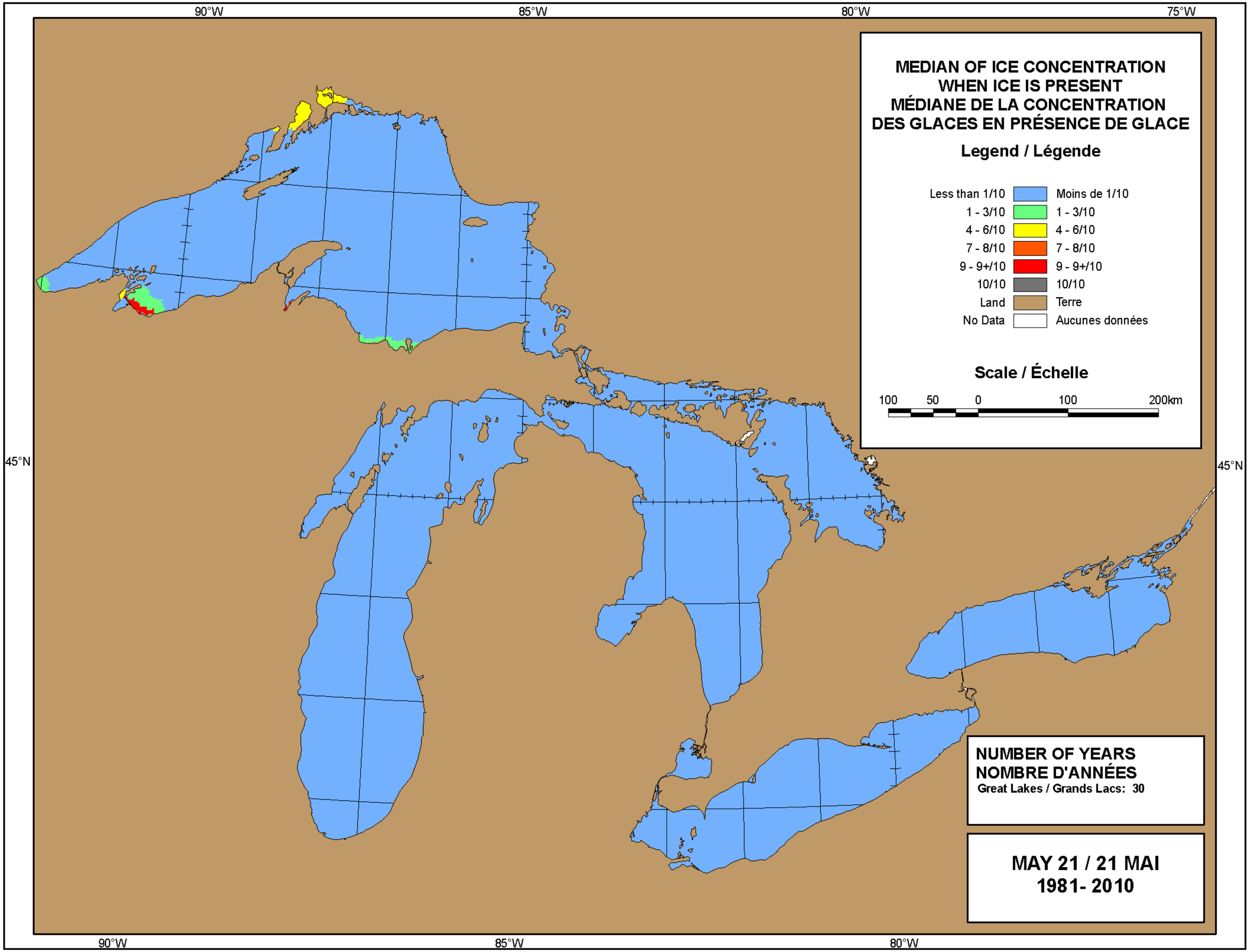
Canada

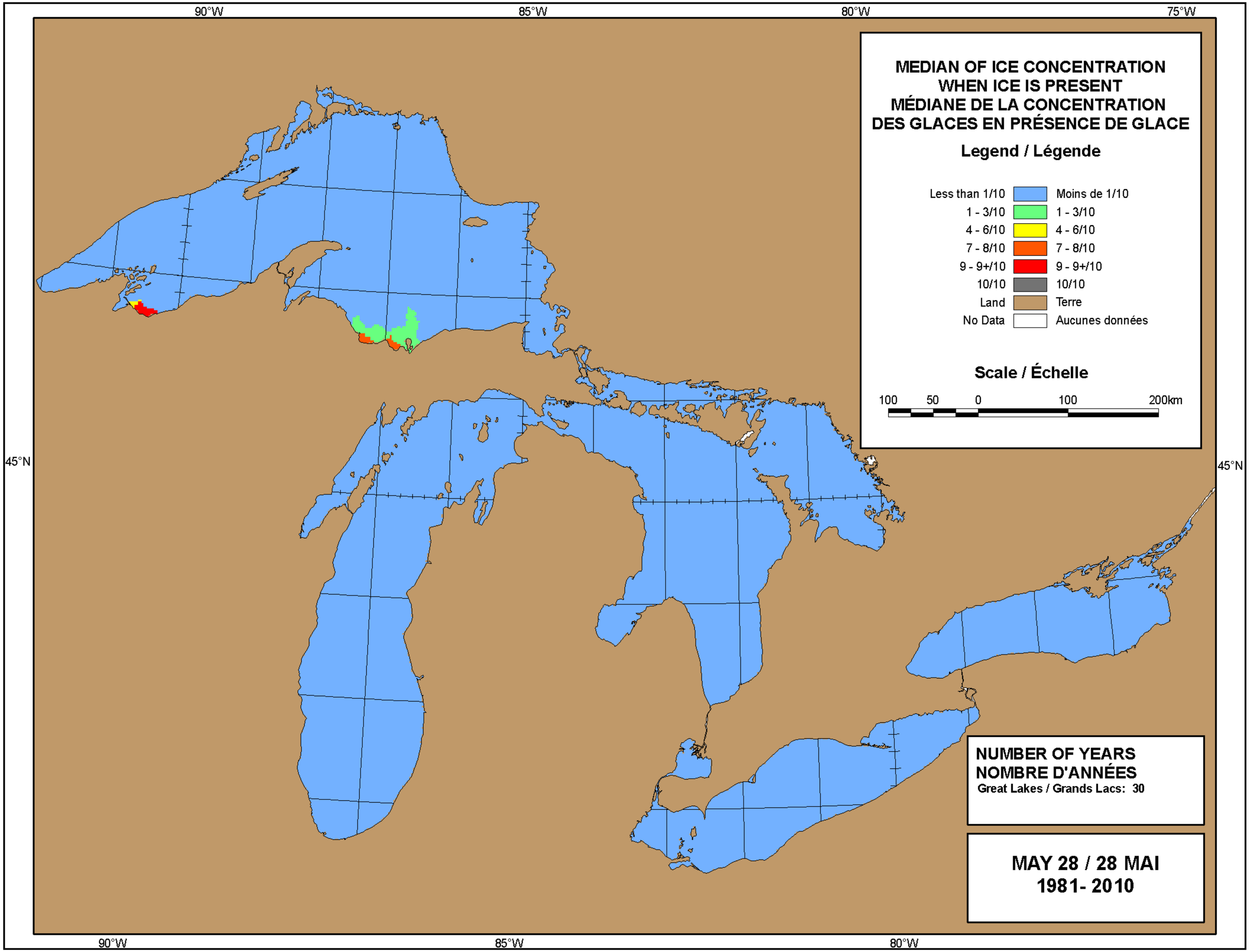
Environment Canada Environnement Canada



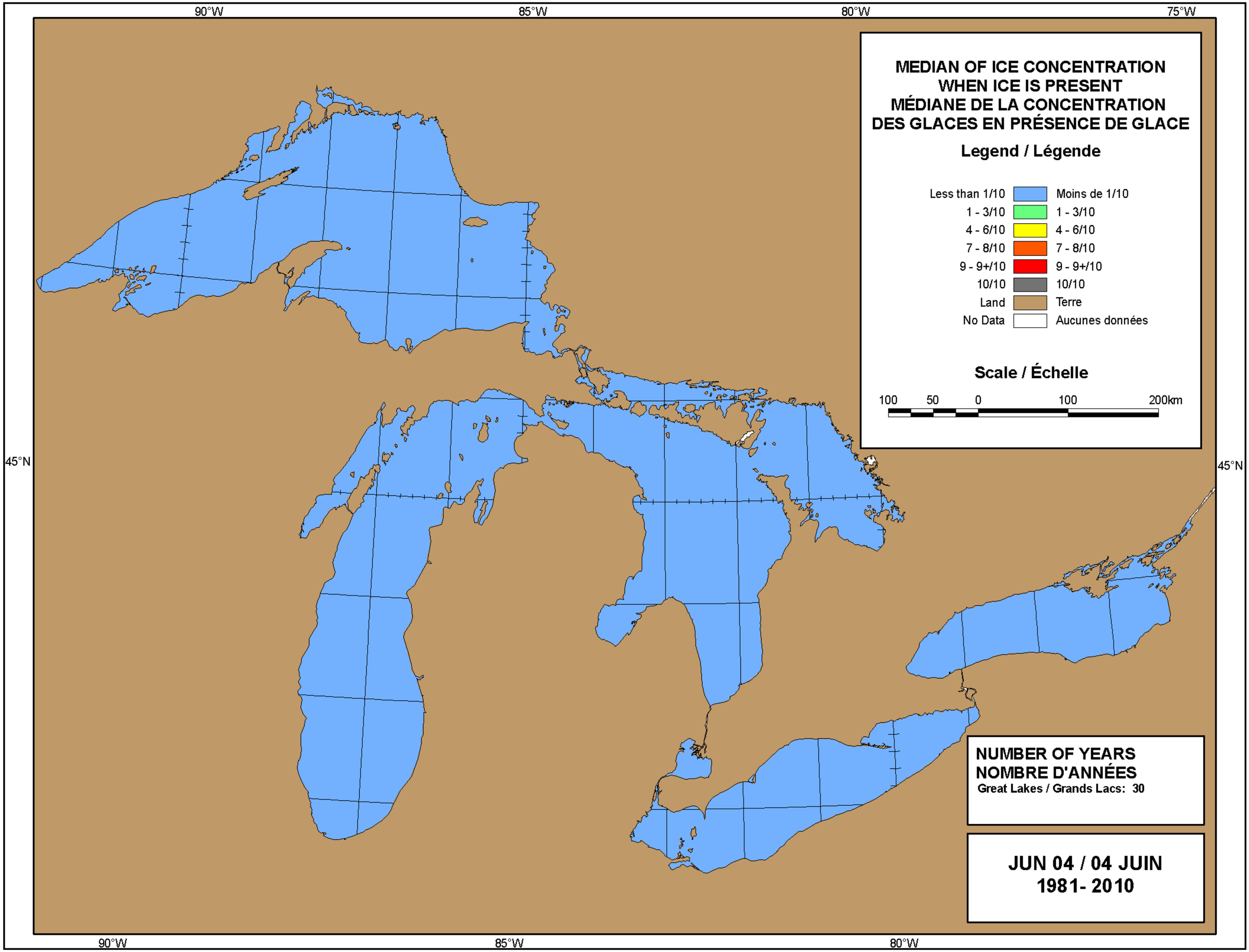
Canada


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 14 / 14 MAI
1981- 2010


90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 21 / 21 MAI
1981- 2010

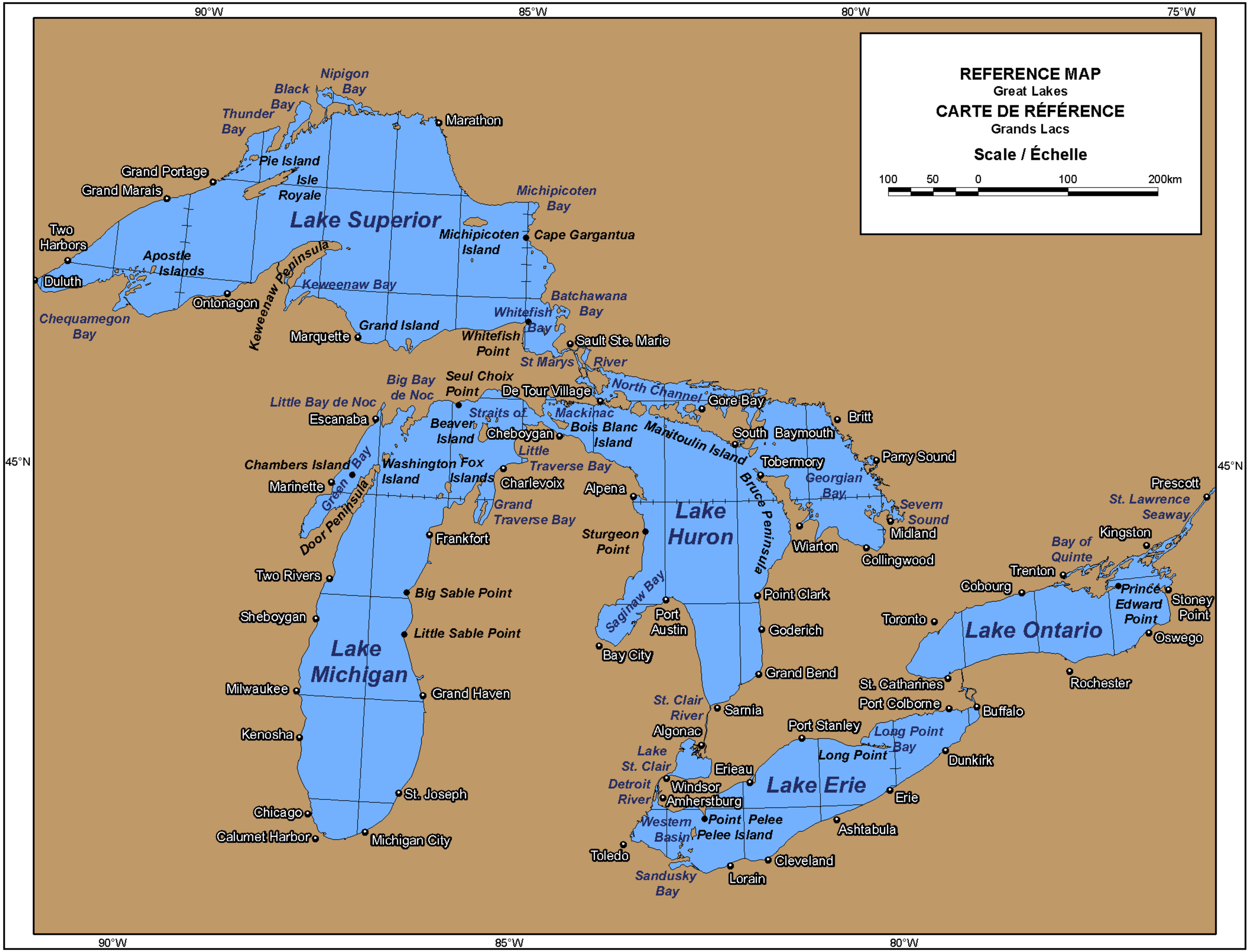

90°W
85°W
80°W
75°W
45°N
MEDIAN OF ICE CONCENTRATION
WHEN ICE IS PRESENT
MÉDIANE DE LA CONCENTRATION
DES GLACES EN PRÉSENCE DE GLACE
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
NUMBER OF YEARS
NOMBRE D'ANNÉES
Great Lakes / Grands Lacs: 30
MAY 28 / 28 MAI
1981- 2010

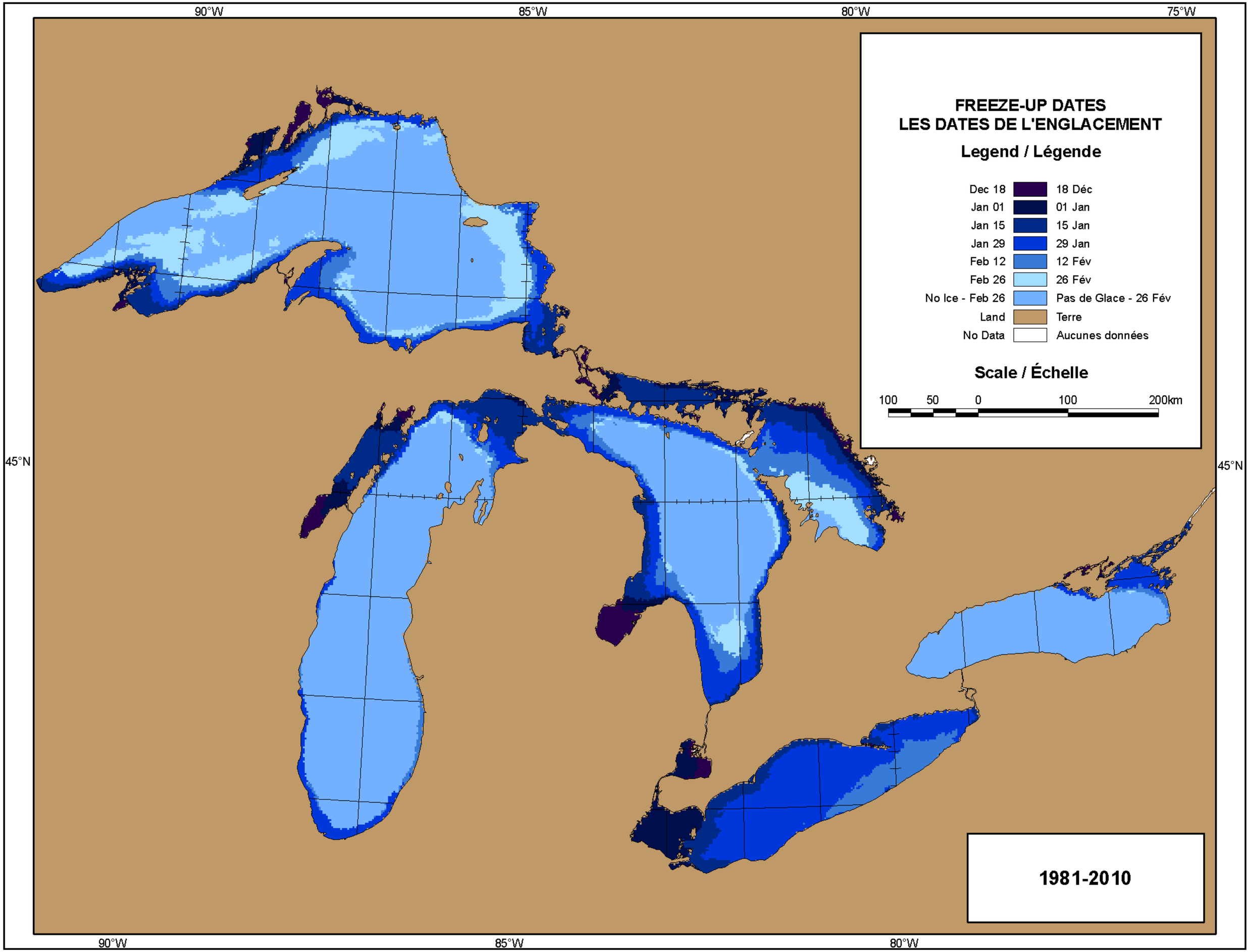
Environment Canada Environnement Canada

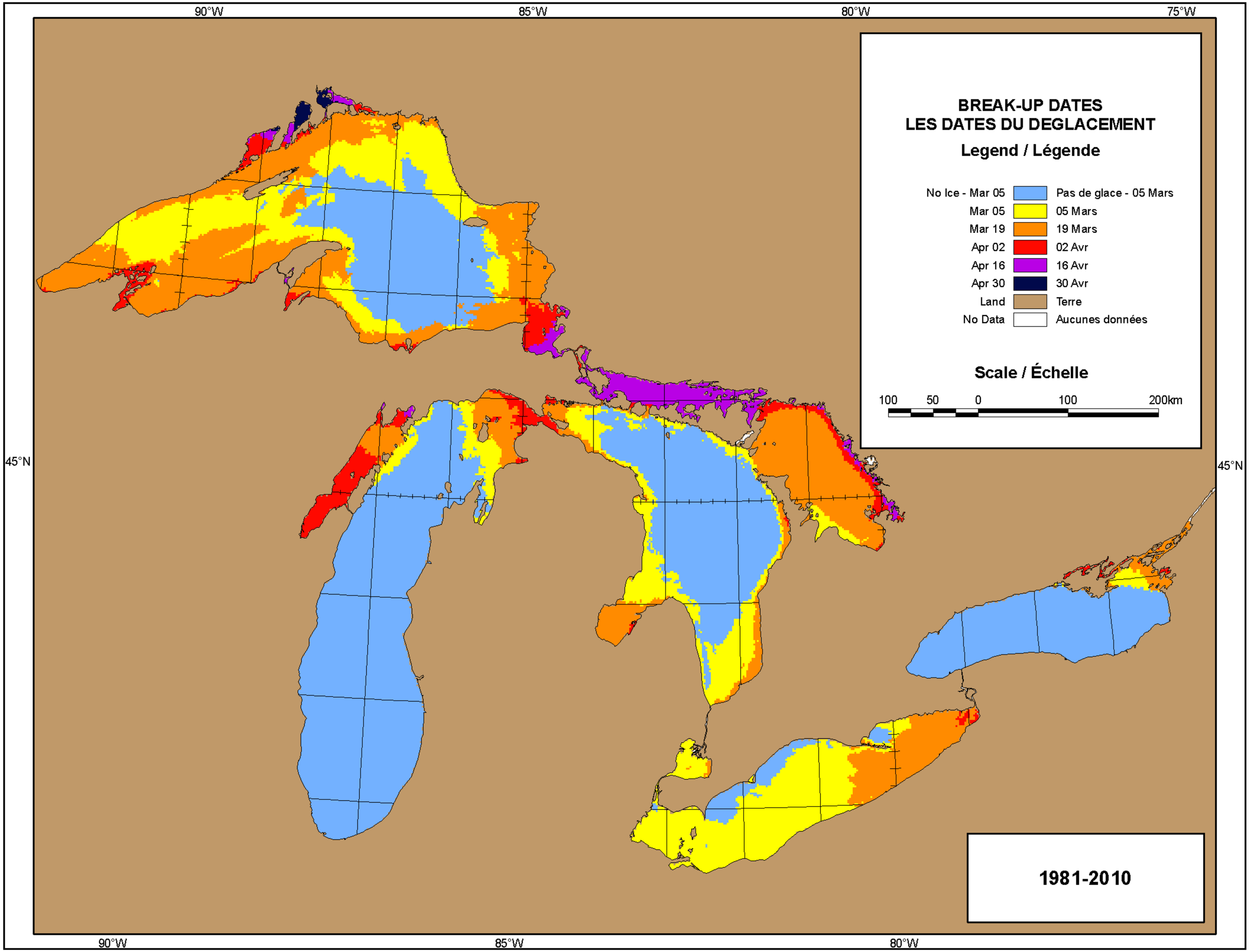


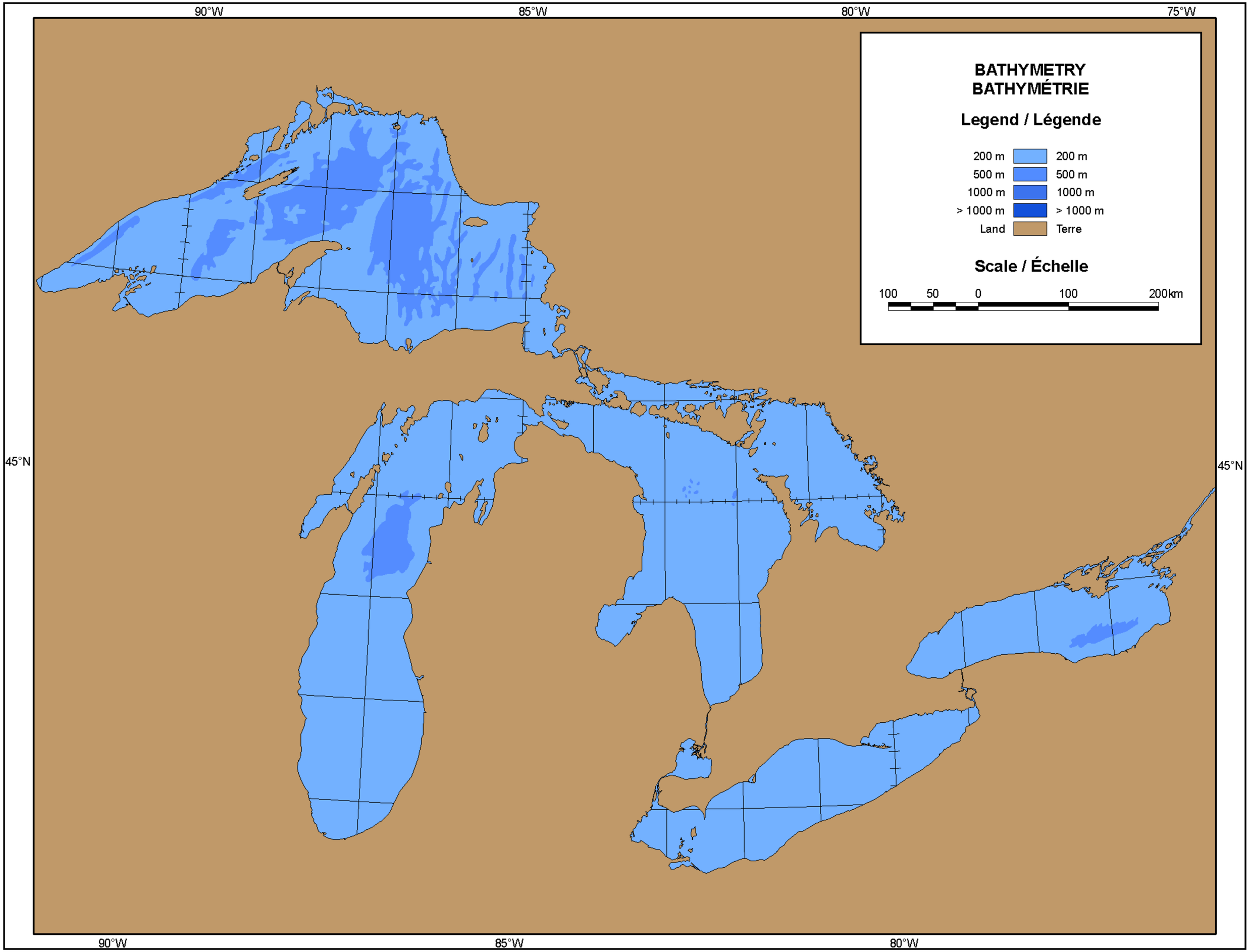
Canada

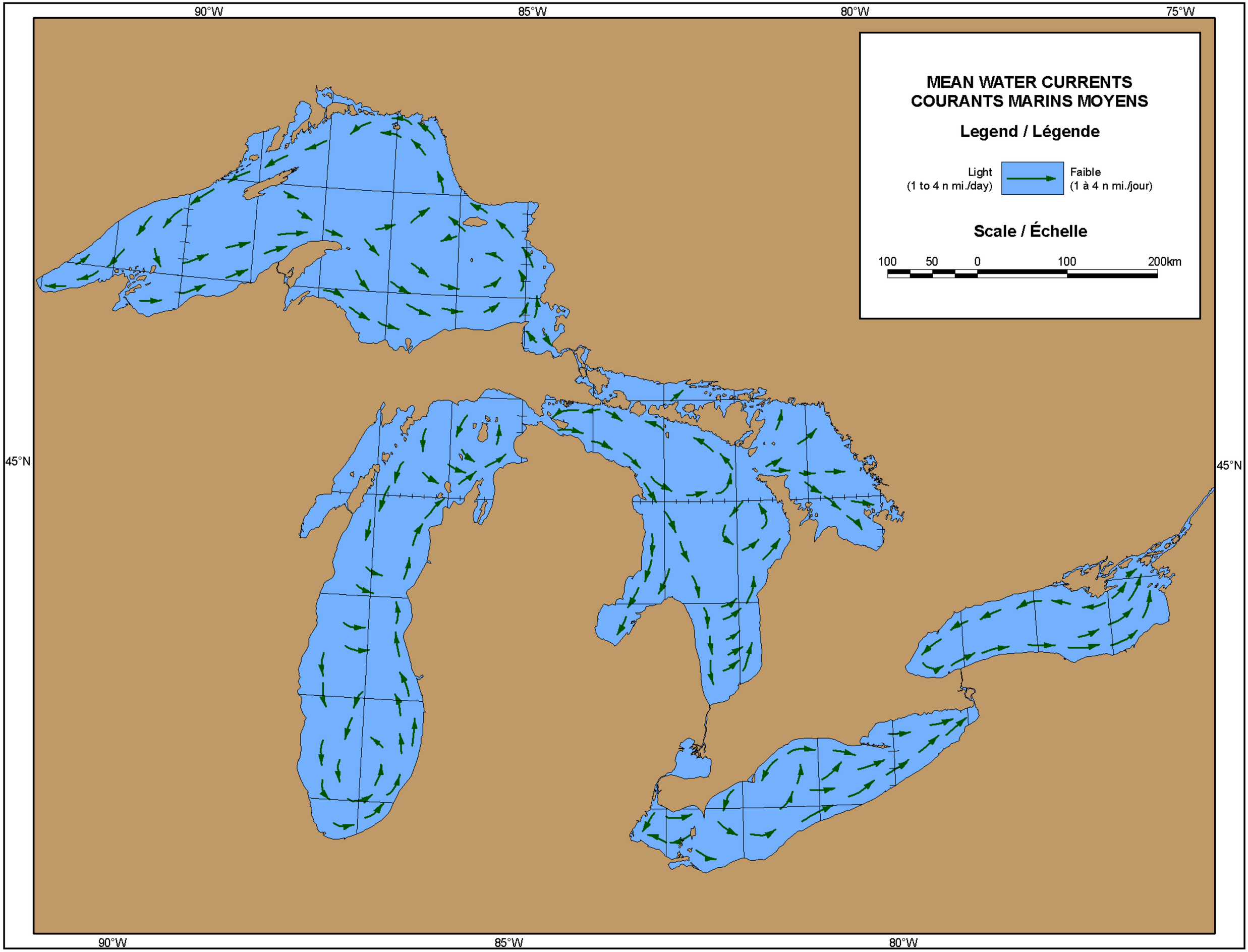
Supporting Maps and Graphs


REFERENCE MAP
Great Lakes
CARTE DE RÉFÉRENCE
Grands Lacs
Scale / Échelle
100 50 0 100 200km
90°W
85°W
80°W
75°W
45°N
Lake Superior
Lake Huron
Lake Michigan
Lake Ontario
Lake Erie
Nipigon Bay
Black Bay
Thunder Bay
Marathon
Pie Island
Isle Royale
Grand Portage
Grand Marais
Michipicoten Bay
Michipicoten Island
Cape Gargantua
Two Harbors
Apostle Islands
Duluth
Keweenaw Peninsula
Keweenaw Bay
Ontonagon
Chequamegon Bay
Marquette
Grand Island
Batchawana Bay
Whitefish Bay
Whitefish Point
Sault Ste. Marie
St Marys River
Big Bay de Noc
Seul Choix Point
De Tour Village
North Channel
Gore Bay
Little Bay de Noc
Escanaba
Straits of Mackinac
Beaver Island
Cheboygan
Bois Blanc Island
Manitoulin Island
South Baymouth
Britt
Parry Sound
Tobermory
Little Traverse Bay
Chambers Island
Green Bay
Washington Island
Fox Islands
Charlevoix
Marinette
Door Peninsula
Grand Traverse Bay
Alpena
Georgian Bay
Bruce Peninsula
Severn Sound
Midland
Prescott
St. Lawrence Seaway
Kingston
Bay of Quinte
Trenton
Frankfort
Sturgeon Point
Wiarton
Collingwood
Two Rivers
Big Sable Point
Saginaw Bay
Point Clark
Cobourg
Prince Edward Point
Stoney Point
Sheboygan
Little Sable Point
Port Austin
Goderich
Toronto
Oswego
Bay City
Grand Bend
Rochester
Milwaukee
Grand Haven
St. Catharines
Port Colborne
Buffalo
St. Clair River
Sarnia
Kenosha
Algonac
Port Stanley
Long Point Bay
Long Point
Dunkirk
Lake St. Clair
Erieau
Detroit River
Windsor
Amherstburg
Erie
St. Joseph
Chicago
Western Basin
Point Pelee
Pelee Island
Ashtabula
Calumet Harbor
Michigan City
Toledo
Cleveland
Sandusky Bay
Lorain


90°W
85°W
80°W
75°W
45°N
FREEZE-UP DATES
LES DATES DE L'ENGLACEMENT
Legend / Légende
Dec 18 18 Déc
Jan 01 01 Jan
Jan 15 15 Jan
Jan 29 29 Jan
Feb 12 12 Fév
Feb 26 26 Fév
No Ice - Feb 26 Pas de Glace - 26 Fév
Land Terre
No Data Aucunes données
Scale / Échelle
100 50 0 100 200km
1981-2010

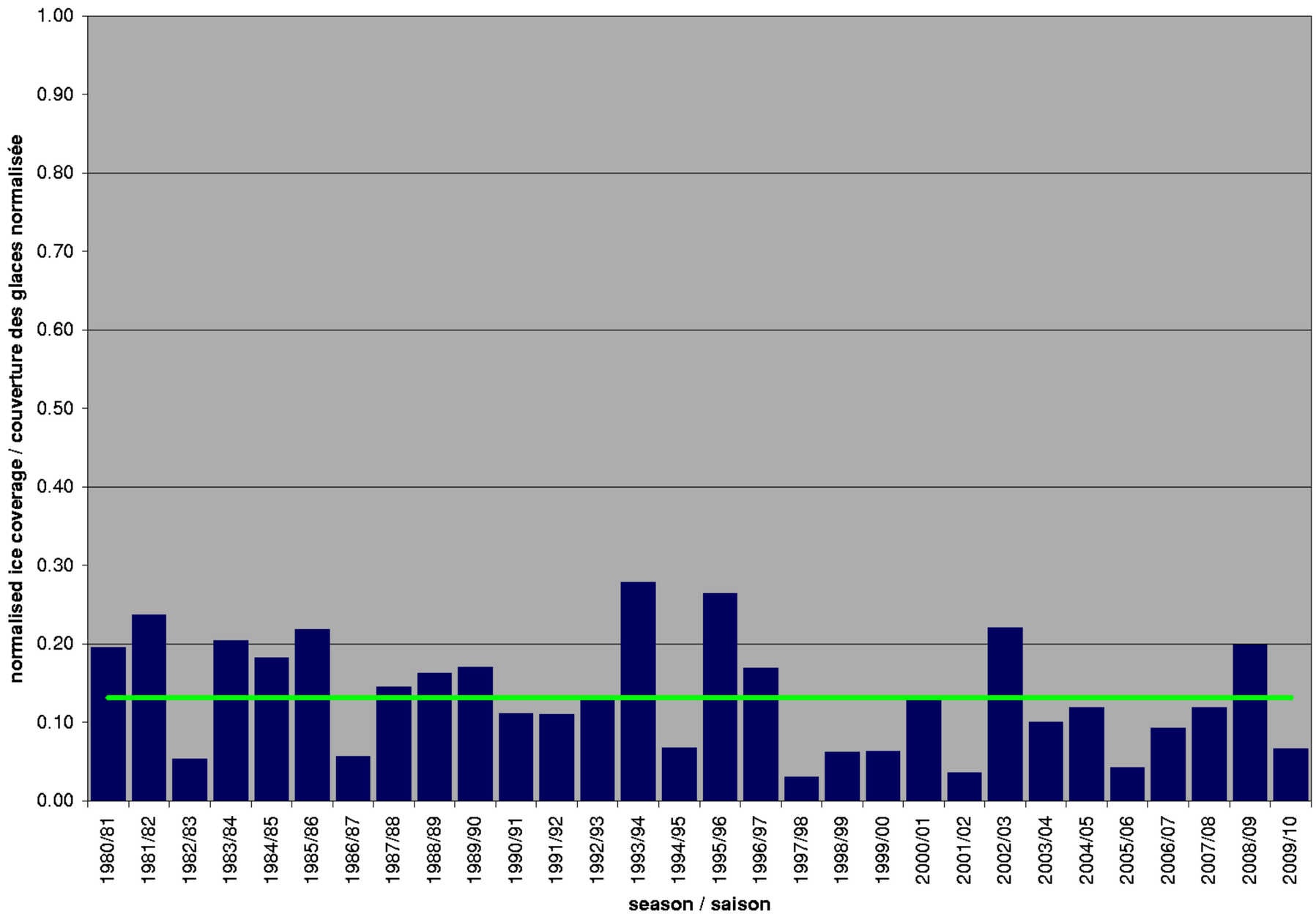

90°W
85°W
80°W
75°W
45°N
BREAK-UP DATES
LES DATES DU DEGLACEMENT
Legend / Légende
No Ice - Mar 05
Pas de glace - 05 Mars
Mar 05
05 Mars
Mar 19
19 Mars
Apr 02
02 Avr
Apr 16
16 Avr
Apr 30
30 Avr
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
1981-2010


90°W
85°W
80°W
75°W
45°N
BATHYMETRY
BATHYMÉTRIE
Legend / Légende
200 m
200 m
500 m
500 m
1000 m
1000 m
> 1000 m
> 1000 m
Land
Terre
Scale / Échelle
100
50
0
100
200km


90°W
85°W
80°W
75°W
45°N
MEAN WATER CURRENTS
COURANTS MARINS MOYENS
Legend / Légende
Light
(1 to 4 n mi./day)
Faible
(1 à 4 n mi./jour)
Scale / Échelle
100 50 0 100 200km

Environment Canada Environnement Canada

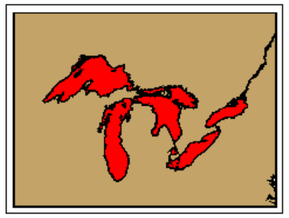
Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Great Lakes / Grands Lacs

ice coverage / couverture des glaces

median / médiane



short name / nom en bref:
GLAKES

source region / région source:
GL / GL

ice season (mmdd) / saison des glaces (mmdd):
1105-0604

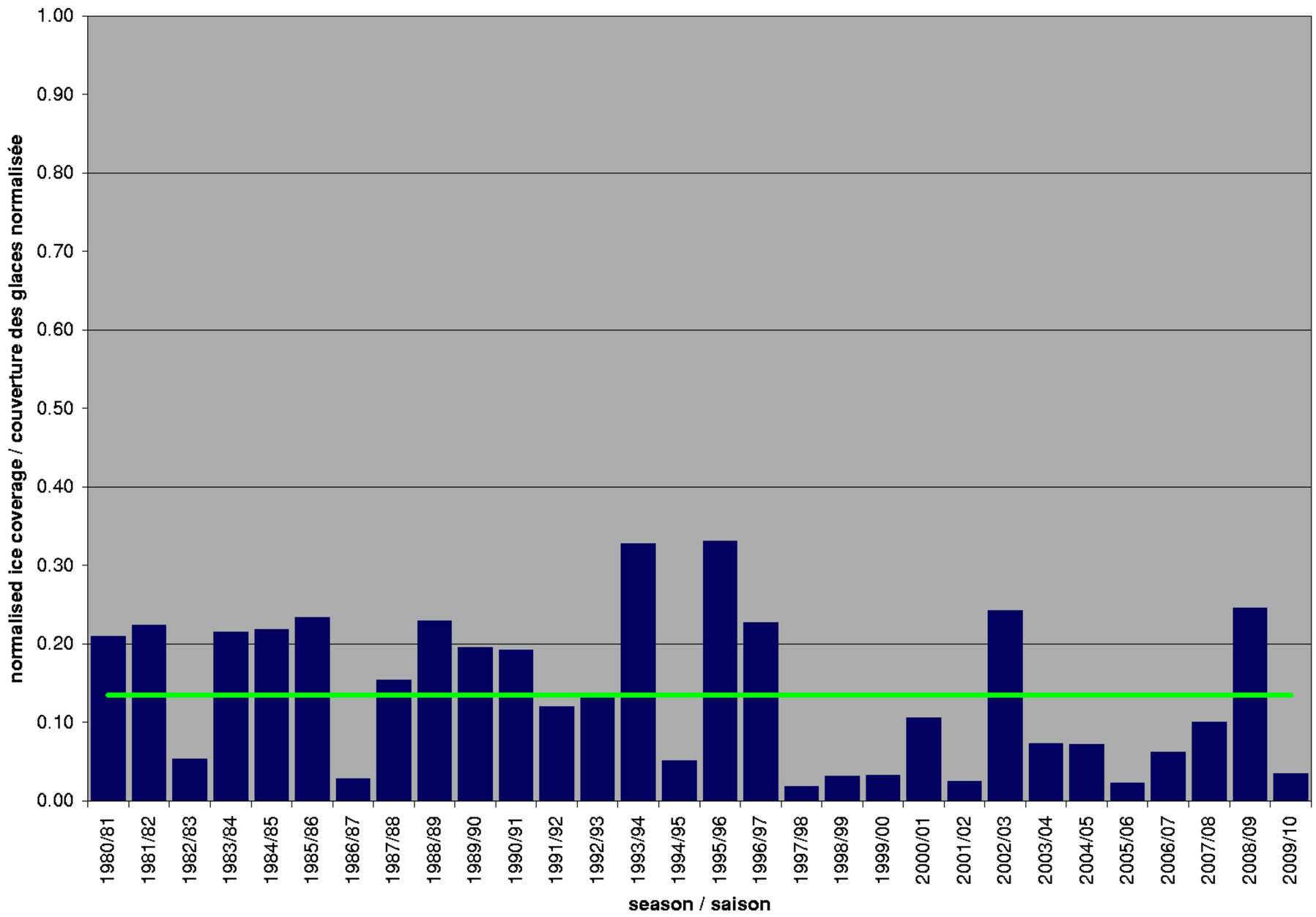
statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada

Environment Canada Environnement Canada

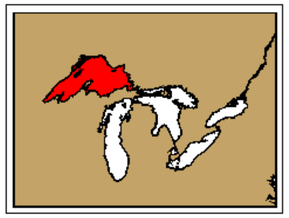
Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Lake Superior / Lac Supérieur

ice coverage / couverture des glaces

median / médiane



short name / nom en bref:
LKSUPER

source region / région source:
GL / GL

ice season (mmdd) / saison des glaces (mmdd):
1105-0604

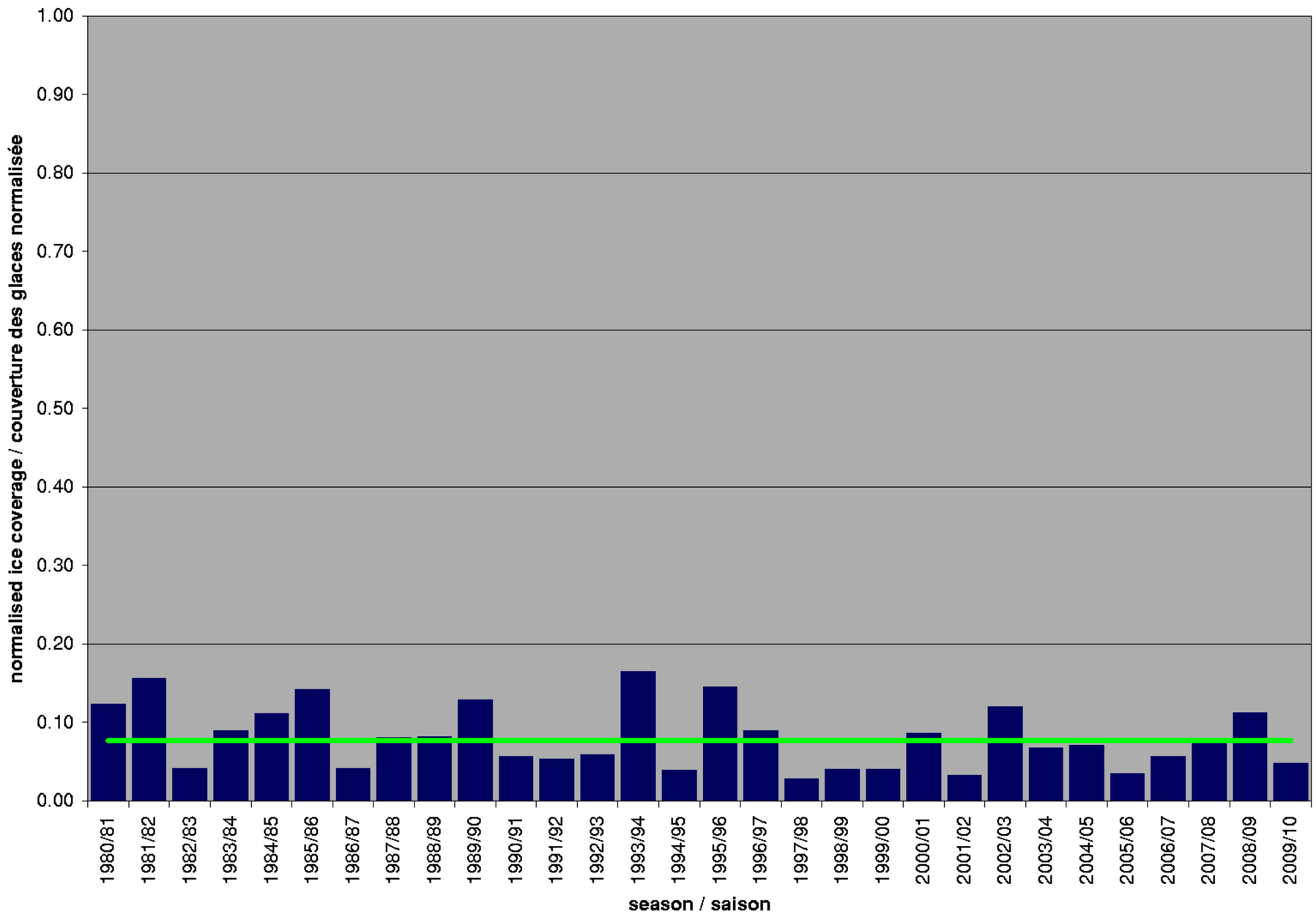
statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada

Environment Canada Environnement Canada

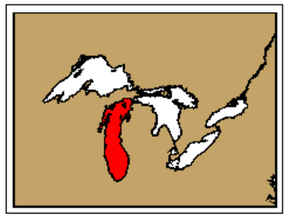
Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Lake Michigan / Lac Michigan

ice coverage / couverture des glaces

median / médiane



short name / nom en bref:
LKMICH

source region / région source:
GL / GL

ice season (mmdd) / saison des glaces (mmdd):
1105-0604

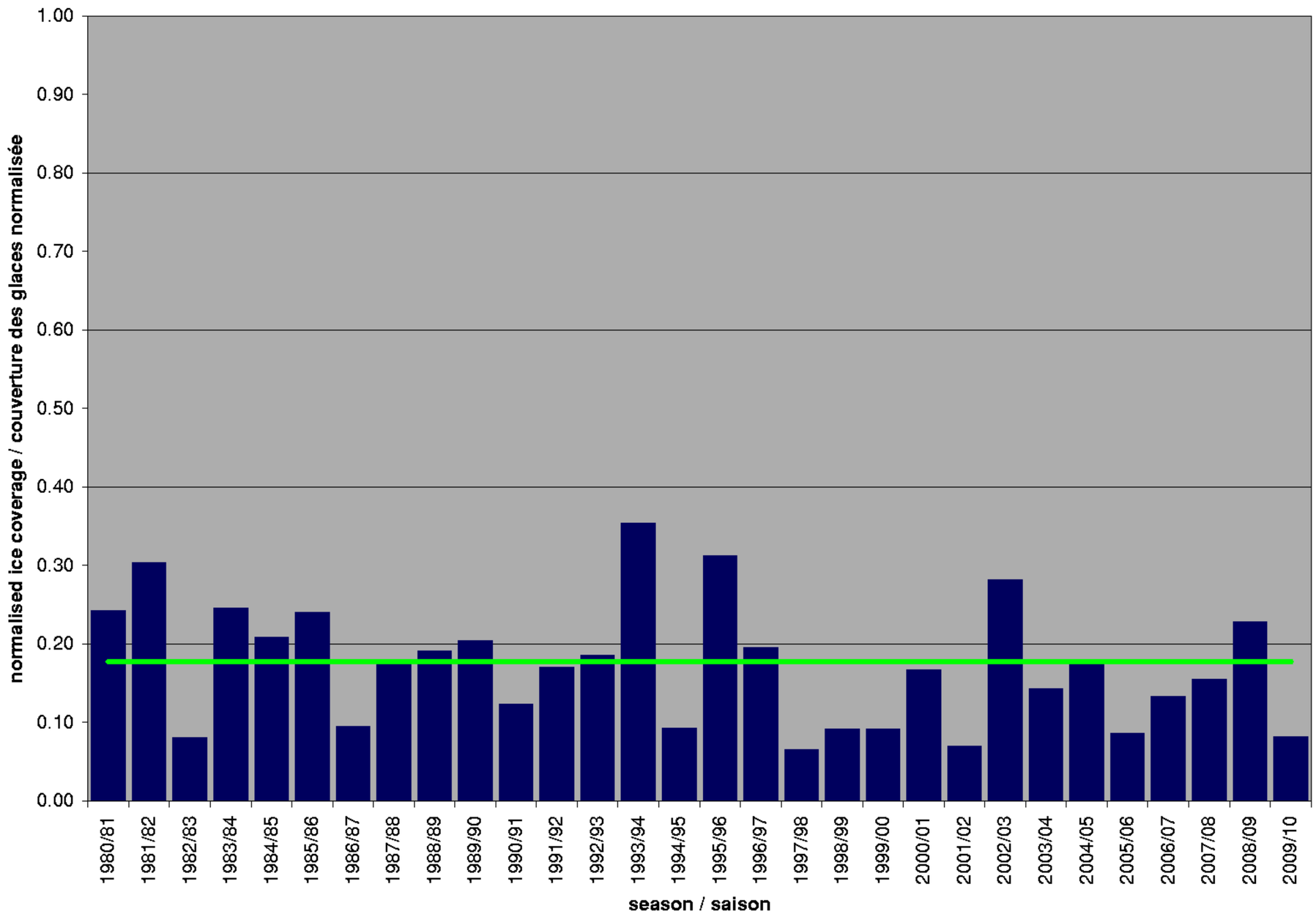
statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada

Environment Canada Environnement Canada

Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Lake Huron / Lac Huron

ice coverage / couverture des glaces

median / médiane

short name / nom en bref:
LKHURON

source region / région source:
GL / GL

ice season (mmdd) / saison des glaces (mmdd):
1105-0604

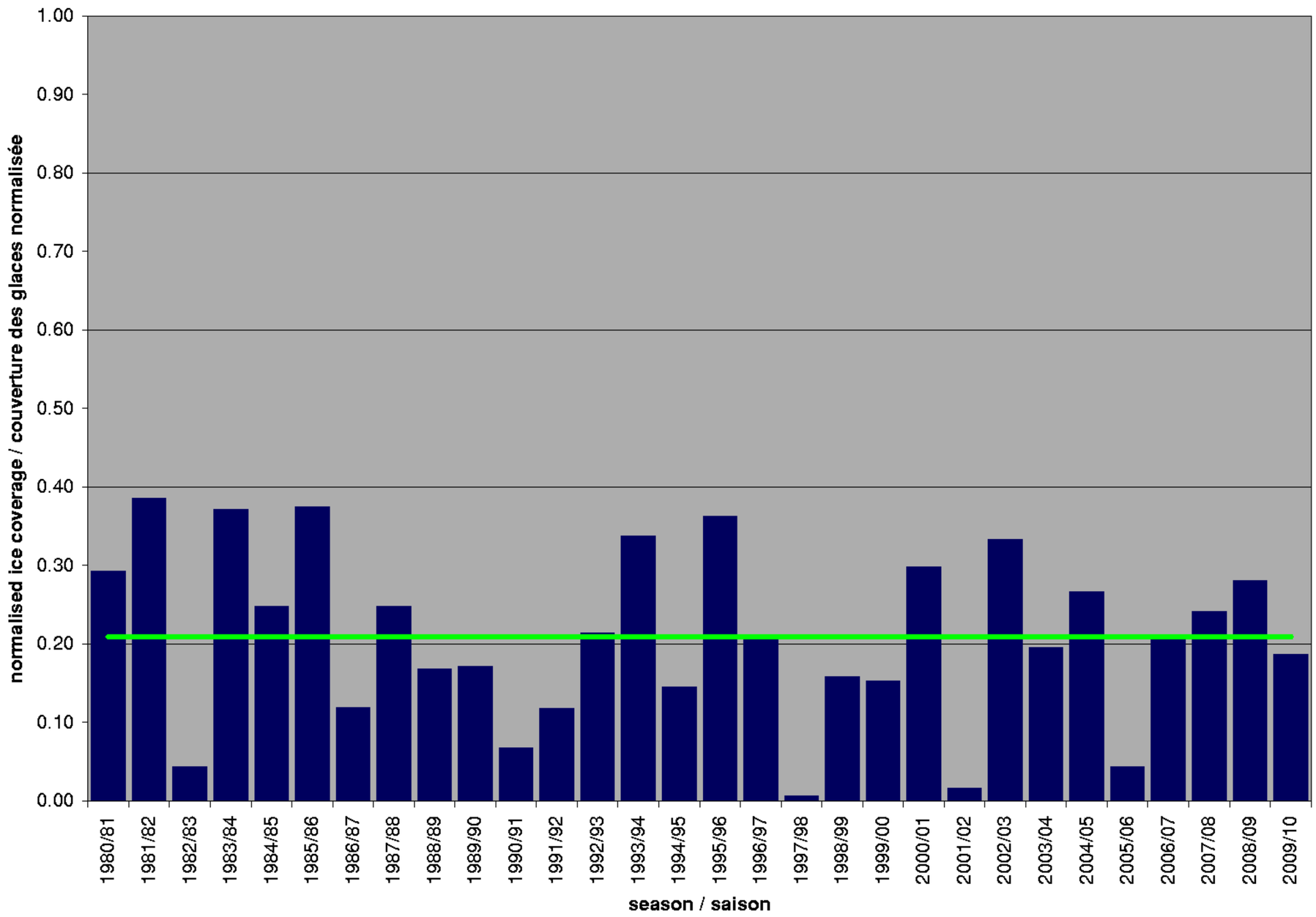
statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada

Environment Canada Environnement Canada

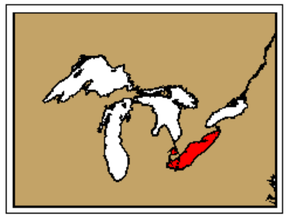
Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Lake Erie / Lac Erié

ice coverage / couverture des glaces

median / médiane



short name / nom en bref:
LKERIE

source region / région source:
GL / GL

ice season (mmdd) / saison des glaces (mmdd):
1105-0604

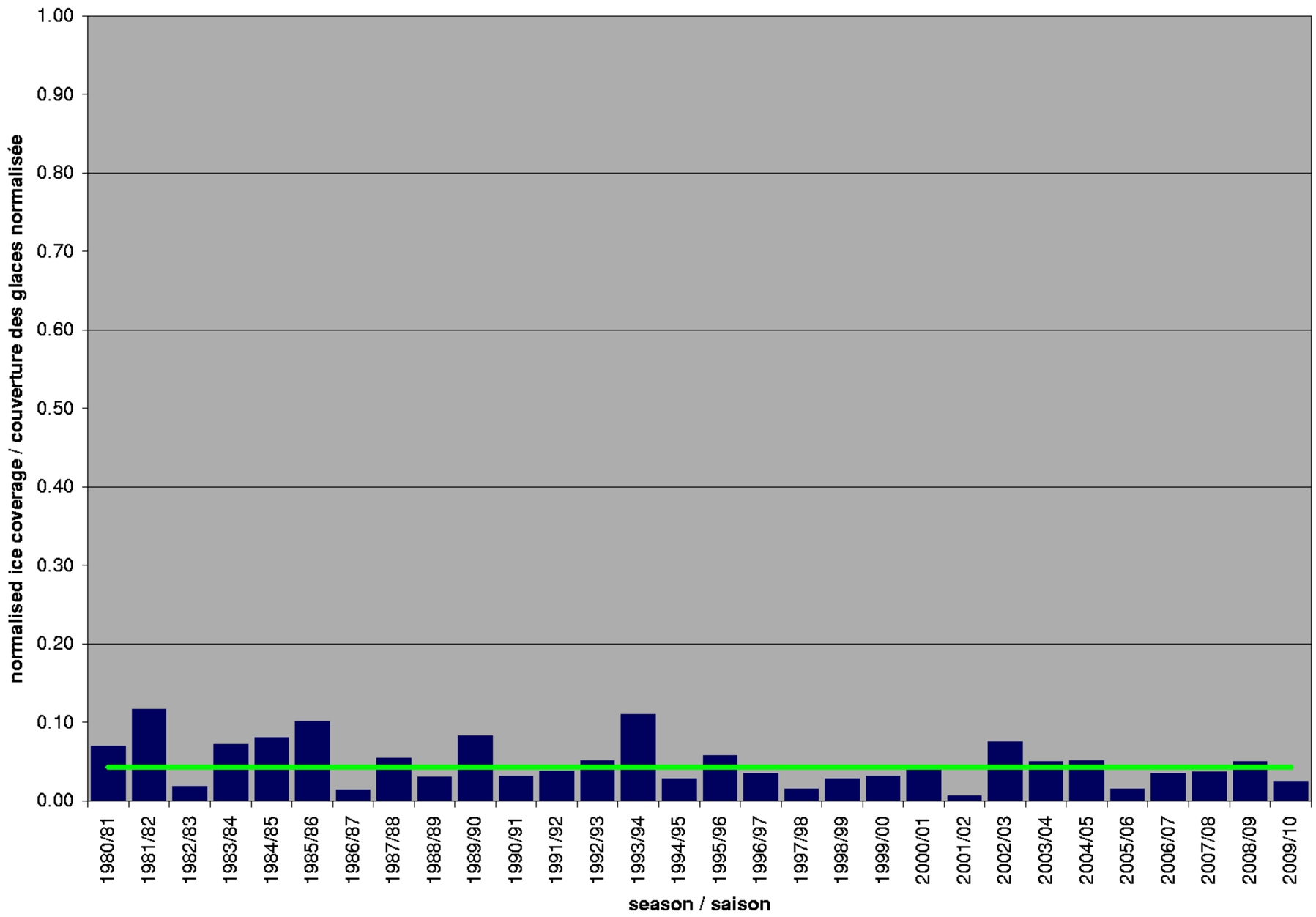
statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada

Environment Canada Environnement Canada

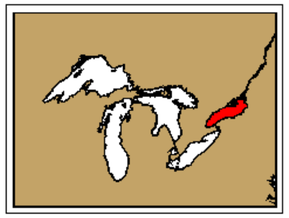
Historical Total Accumulated Ice Coverage 1105 - 0604 / Total accumulé de la couverture des glaces historique 1105 - 0604



Lake Ontario / Lac Ontario

ice coverage / couverture des glaces

median / médiane



short name / nom en bref:
LKONT

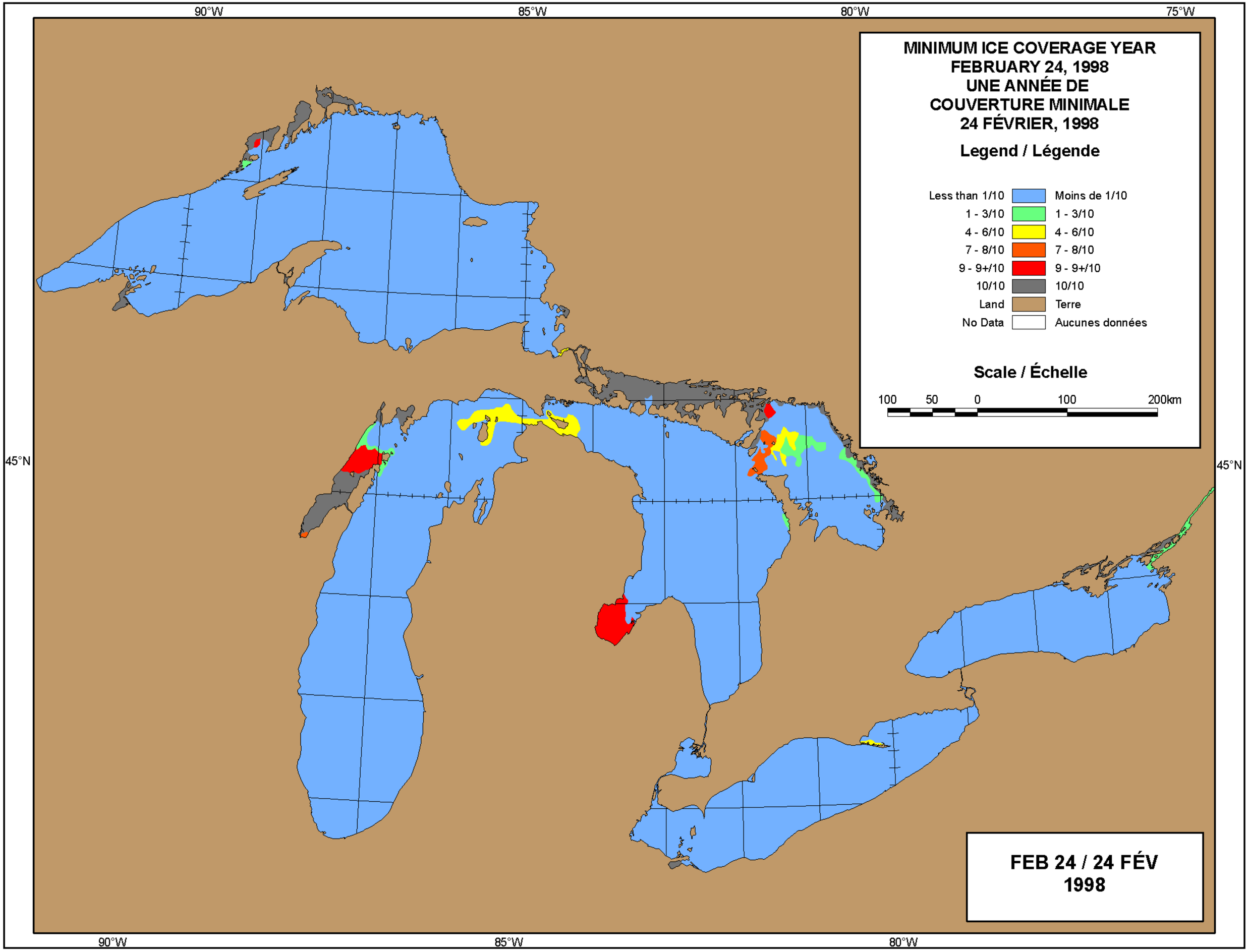
source region / région source:
GL / GL

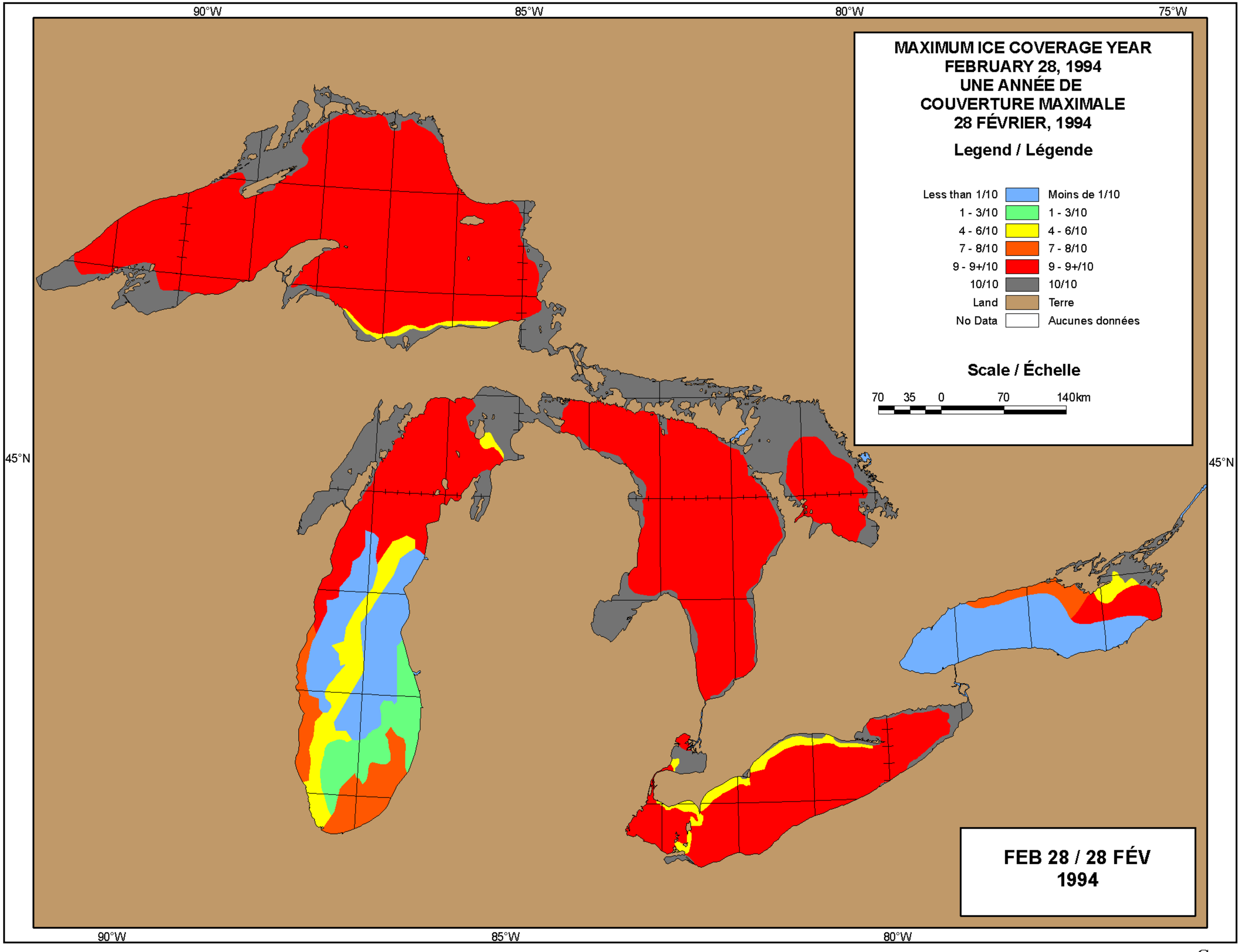
ice season (mmdd) / saison des glaces (mmdd):
1105-0604

statistics based upon / les statistiques basées sur:
1980/81-2009/10

by / par:
CIS / SCG

Canada


90°W
85°W
80°W
75°W
45°N
MINIMUM ICE COVERAGE YEAR
FEBRUARY 24, 1998
UNE ANNÉE DE
COUVERTURE MINIMALE
24 FÉVRIER, 1998
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
100 50 0 100 200km
FEB 24 / 24 FÉV
1998


90°W
85°W
80°W
75°W
45°N
MAXIMUM ICE COVERAGE YEAR
FEBRUARY 28, 1994
UNE ANNÉE DE
COUVERTURE MAXIMALE
28 FÉVRIER, 1994
Legend / Légende
Less than 1/10
Moins de 1/10
1 - 3/10
1 - 3/10
4 - 6/10
4 - 6/10
7 - 8/10
7 - 8/10
9 - 9+/10
9 - 9+/10
10/10
10/10
Land
Terre
No Data
Aucunes données
Scale / Échelle
70 35 0 70 140km
FEB 28 / 28 FÉV
1994