**North American Land Cover 2010, 30 meters**

**2010 Version 1**

Released: 2017

**Alaska and Conus**

Land cover data for Alaska and the Conterminous Unted States was derived from the National Land Cover Dataset (NLCD) 2011, and cross-walked to the NALCMS classification scheme by the United States geological Survey (USGS). The source map was produced using information from Thematic Mapper (TM) and Enhanced Thematic Mapper (ETM+) Landsat sensors.

**Canada**

Lands caver data was provided by the Canada Centre for Remote Sensing (CCRS) and corresponds to year 2010. The data was already delivered in the 19 classes of the NALCMS classification scheme. The source map was produced using information from Thematic Mapper (TM) and Enhanced Thematic Mapper (ETM+) Landsat sensors.

**Mexico**

Data was derived from the MAD-MEX land cover map (version 4.3) provided by the National Commission for the Knowledge and Use of Biodiversity (CONABIO). The source map was produced using information from Thematic Mapper (TM) and Enhanced Thematic Mapper (ETM+) Landsat sensors.

**North America**

The minimum mapping unit for the first version was defined as 1 pixel for the urban class and 5 pixels for the rest of the land cover classes in the NALCMS classification scheme.

This map version showed a water buffer along the coast of the three countries.

**2010 Version 2**

Released: 2020

**North America**

The water buffer along the coastline was removed to ensure consistency in the statistical calculations of class 18 (water) without including ocean water.

In the three countries, there was a change in the minimum map mapping unit. Different from Version 1, where a minimum mapping unit of 1 pixel was defined for urban classes and 5 pixels for the rest of the land cover classes, in Version 2, a standard minimum mapping unit of 5 pixels was defined for all classes.

In calculating the minimum mapping unit, Class 0 (background) was excluded. Any cluster of fewer than 5 pixels surrounded by Class 0 (e.g., pixels in sea areas) was not eliminated and thus remained on the map. No changes were made along the coastline, as Class 0 was not allowed to expand.

**2010 Version 3**

Released: 2024

**Alaska and Conus**

The latest map delivered in February 2024 by the USGS for Alaska features a significantly improved road network, particularly in the far north. The map is now cleaner along the Arctic coast, as it has fewer speckled areas over the original water buffer. Additionally, it provides a more accurate representation of elongated islands in the Arctic Ocean, many of which were missing in version 2 of the 2010 NAMCLS North American map. A few empty pixels on the mainland were also filled using the values from neighboring pixels.

Similar to the Alaska section of the North American map, the USGS delivered an updated version of the Conterminous United States Land Cover map in February 2024. This new version has been cross-walked to align with the NALCMS land cover classification scheme and is based on the latest version of the National Land Cover Dataset (NLCD) 2011. Compared to previous versions, this updated map features a more accurately delineated coastline and fewer speckled areas over the water buffer.

In order to cross-walk NLCD legend classes to NALCMS legend classes a sub-tropical mask for the conterminous United States and a sub-polar mask for Alaska were required. This mask was necessary to differentiate between temperate and sub-tropical/sub-polar areas.

As with the previous version, the water buffer included in each USGS delivery has been removed to ensure consistency in the calculation of all land cover classes, including continental water, and to avoid the inclusion of sea areas.

**Canada**

Version 3 integrates an update of the Canadian Land Cover dataset delivered by the Canada Centre for Remote Sensing (CCRS) in February 2024. The newest version of the 2010 Canadian land cover dataset is derived from updated detection of change areas between 2015-2010 and the a priori changes identified between 2020-2015. The 2020 Canada land cover map is the result of improved classification methods used in the first version of the maps. As a result, Canada uses 2020 as the base year for change detection instead of 2010.

According to CCRS, the most recent update in the land cover time series includes improvements in mapping mining areas. High-resolution data and some auxiliary information were used to verify and enhance accuracy over mining sites, along with minor adjustments in a few cities. Corrections were necessary because some parts of mining areas were mislabeled as barren land or low vegetation.

Sparse areas with small patches of empty pixels in northern Quebec and the Labrador Peninsula were corrected by filling them with values from the previous Canada 2010 land cover map.

**Mexico**

The Mexican section for the North American Land Cover map did not require any updates. NALCMS Mexico map Version 2 was used as input for Version 3 of the North American Land Cover map.

**North America**

The minimum mapping unit remains 5 pixels for all classes; however, in this new version, class 0 (background) has been included, allowing pixel patches smaller than 5 pixels surrounded by class 0 to be reclassified as background. This adjustment helps eliminate individual pixels or small pixel patches in the sea area that remained after the water buffer was removed. Additionally, this change allows class 0 to expand along the coastline when small pixel patches were not primarily surrounded by other land class values.

**North American Land Cover 2015, 30 meters**

**2015 Version 1**

Released: 2020

**Alaska and Conus**

Land cover data for Alaska and the Conterminous United States was sourced from the National Land Cover Dataset (NLCD) 2016 and adapted to the NALCMS classification scheme by the United States Geological Survey (USGS).

**Canada**

Land cover data, provided by the Canada Centre for Remote Sensing (CCRS), corresponds to the year 2015 and was already delivered in the 19 classes of the NALCMS classification scheme. The land cover dataset for Canada was produced using observation from Operational Land Imager (OLI) Landsat sensor.

**Mexico**

Unlike the NALCMS 2010 land cover map, which utilized information from sensors onboard Landsat satellites, the 2015 Mexican land cover dataset is based on the MAD-MEX land cover map derived from RapidEye data with a resolution of 5 meters. The 2015 MAD-MEX map was resampled to 30 meters to align with the resolution of the other national maps in North America, and the map legend was cross-walked to the NALCMS classification scheme.

**North America**

The water buffer along the coastline was eliminated to maintain consistency in the statistical calculations for Class 18 (water), excluding ocean water.

A minimum mapping unit of 5 pixels was established for all classes. In defining this minimum unit, Class 0 (background) was excluded from the calculations. Clusters smaller than 5 pixels that were surrounded by Class 0 (such as pixels in ocean areas) were not removed and remained visible on the map.

**2015 Version 2**

Released: 2020

**Alaska and Conus**

In July 2020, USGS provided an updated land cover map of Alaska, which was subsequently integrated into the continental map, replacing version 1.

As with the previous version, the water buffer was removed to maintain consistency in the calculation of all land cover classes, including continental water, and to prevent the inclusion of sea areas.

**2015 Version 3**

Released: 2023

**Canada**

Land Cover over the Canada section was updated using a revised version of the Canadian dataset, which was released on May 1, 2023.

The water buffer present in the map provided by CCRS was removed to ensure consistency in the calculation of all land cover classes, including continental water, and to avoid the inclusion of sea areas. Sparse areas with small patches of empty pixels in northern Quebec and the Labrador Peninsula were corrected by filling them with values from the previous Canada 2015 land cover map.

**2015 Version 4**

Released: 2024

**Alaska and Conus**

These two sections of the North American land cover map represent an update provided by USGS in February 2024. Both maps were generated from the latest version of the 2016 NLCD products for Alaska and the Conterminous United States. The USGS aligned the NLCD classification scheme with the 19 land cover classes used by NALCMS.

In order to differentiate sub-polar and temperate areas in Alaska, a dataset identifying areas of permafrost was used to identify potential sub-polar regions. Areas of the dataset with values greater than or equal to a permafrost occurrence greater than 50 percent were considered sub-polar. Some additional localized modeling and hand-editing was required to generate the final sub-polar mask

A few empty pixels on the mainland were filled using values from adjacent pixels. As with previous versions, the water buffer included in each USGS delivery was removed to maintain consistency in the calculation of all land cover classes, including continental water, and to prevent the inclusion of sea areas.

**Canada**

Version 4 includes an updated Canadian Land Cover dataset provided by the Canada Centre for Remote Sensing (CCRS) in February 2024. This latest iteration of the 2015 Canadian land cover dataset is based on refreshed change detection from 2022 to 2015. The 2020 Canada land cover map utilizes improved classification techniques. Consequently, Canada has established 2020 as the reference year for change detection, replacing the previous base year of 2010.

As noted by CCRS, the latest update in the land cover time series features enhancements in the mapping of mining regions. High-resolution data, along with additional information, was employed to verify and improve accuracy in mining areas, alongside minor adjustments made in certain urban locations. These corrections were essential as some sections of mining regions had been incorrectly categorized as barren land or low vegetation.

In northern Quebec and the Labrador Peninsula, sparse areas with small clusters of empty pixels were rectified by filling them with values from the previous Canada 2015 land cover map

**Mexico**

The Mexico section of the North American map has not been updated in the fourth version of the 2015 NALCMS map. The version used for the Mexico map still corresponds to its version 1.

**North America**

The water buffer along the coastline was eliminated to maintain consistency in the statistical calculations for Class 18 (water), excluding ocean water.

The minimum mapping unit continues to be 5 pixels for all classes; however, this new version includes class 0 (background), which enables pixel patches smaller than 5 pixels that are surrounded by class 0 to be reclassified as background. This modification assists in removing isolated pixels or small patches in the sea area that persisted after the water buffer was eliminated. Furthermore, this change allows class 0 to extend along the coastline when small pixel patches are not primarily surrounded by other land class values.

**North American Land Cover 2020, 30 meters**

**2020 Version 1**

Released: 2023

**Alaska and Conus**

Unlike the NALCMS Maps from 2010 and 2015, which represented a 5-year time interval based on NLCD data from 2011 and 2016, the 2020 North American map presents a 3-year land change interval for the contiguous United States (CONUS) while maintaining a 5-year interval for Alaska.

The NLCD 2019 map for CONUS was the version available during the assembly of the North American map and was used by the USGS to create the cross-walked map within the NALCMS classification scheme.

For Alaska, the USGS provided a land cover map representing 2021, generated in February 2023. The Alaska map used to align the NLCD classes with the NALCMS classification scheme is an internal file that has not yet been made publicly available.

**Canada**

This version of the Canadian land cover dataset was generated by CCRS through change detection between 2015 and 2020. The 2015 land cover of Canada was previously calculated based on change detection from 2010 to 2015, with 2010 being the base year established in that version for the definitions of Canadian Land Cover series at 5-year intervals. The land cover dataset for Canada was produced using observation from Operational Land Imager (OLI) Landsat sensor.

In northern Quebec and the Labrador Peninsula, sparse areas with small clusters of empty pixels were rectified by filling them with values from the latest version of the 2015 land cover map.

**Mexico**

Unlike the Mexican land cover input map used in 2015, which was derived from a 5-meter cell size input map, the 2020 land cover map provided by CONABIO is based on 30-meter resolution Landsat data.

**North America**

The water buffer along the coastline was removed to ensure consistency in the statistical calculations for Class 18 (water), excluding ocean water.

A minimum mapping unit of 5 pixels was set for all classes, with Class 0 (background) excluded from these calculations. Clusters smaller than 5 pixels that were surrounded by Class 0, such as those in ocean areas, were not eliminated and remain visible on the map.

**2020 Version 2**

Released: 2024

**Alaska and Conus**

These two sections of the North American land cover map reflect an update provided by the USGS in February 2024. Unlike version 1, where CONUS data was derived from NLCD 2019, this new version reinstates 5-year intervals for all map sections, as the input data for CONUS is now NLCD 2021.

For Alaska, the USGS provided a new version of the map in February 2024, representing 2021 land cover data. The updated Alaska map used to align the NLCD classes with the NALCMS classification scheme is an internal file that has not yet been made publicly available.

To distinguish sub-polar from temperate areas in Alaska, a dataset identifying permafrost regions was used to define potential sub-polar zones. Regions with permafrost occurrence equal to or greater than 50 percent were classified as sub-polar. Additional localized modeling and manual editing were necessary to produce the final sub-polar mask.

A few empty pixels on the mainland were filled using values from adjacent pixels. As in previous versions, the water buffer included in each USGS delivery was removed to ensure consistency in the calculation of all land cover classes, including continental water, and to prevent the inclusion of sea areas.

**Canada**

The map used for Canada was an update provided by CCRS in February 2024. The 2020 Canada land cover map results from improved classification methods applied in the first version of the maps. Consequently, Canada now uses 2020 as the base year for change detection, replacing the previous base year of 2010.

According to CCRS, the latest update in the land cover time series includes enhancements in mapping mining regions. High-resolution data, along with supplementary information, was used to verify and improve accuracy in these mining areas, as well as to make minor adjustments in certain urban locations. These corrections were necessary because some parts of mining regions had been misclassified as barren land or low vegetation.

Sparse areas with small patches of empty pixels in northern Quebec and the Labrador Peninsula were rectified by filling them with values from the previous version of Canada 2020 land cover map.

**Mexico**

The Mexican section for the North American Land Cover map did not require any updates. NALCMS Mexico map Version 1 was used as input for Version 2 of the North American Land Cover map.

**North America**

The water buffer along the coastline was removed to ensure consistency in the statistical calculations for Class 18 (water), excluding ocean water.

The minimum mapping unit remains 5 pixels for all classes; however, this new version introduces Class 0 (background), which allows pixel patches smaller than 5 pixels that are surrounded by Class 0 to be reclassified as background. This adjustment helps eliminate isolated pixels or small patches in the sea area that remained after the removal of the water buffer. Additionally, this change enables Class 0 to extend along the coastline when small pixel patches are not primarily bordered by other land class values.