



Northern Land Cover of Canada – Circa 2000

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Generated to provide spatially and thematically consistent land and vegetation cover information for Northern Canada north of the treeline (Timoney et al., 1992), this dataset was based on medium resolution (30 m) Landsat images.

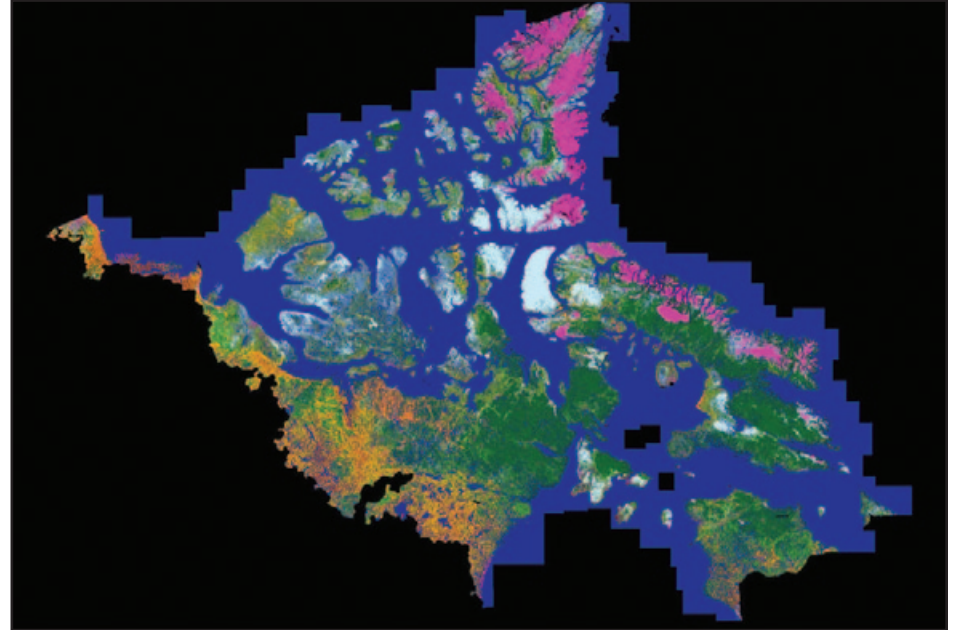
The purpose of the database is to support applications related to northern land cover, including environmental impact assessment, wildlife and biodiversity conservation, protected area conservation, water quality assessment, resource extraction, community planning and renewable energy exploration.

These data are now available for free download through Geogratis so that scientists and policy makers working on northern issues have access to detailed geospatial data. In addition, the dataset is intended to provide an unprecedented snapshot of Northern Canada for educational purposes. The data collection includes a 15 land cover class product (see Legend) as well as a 200 spectral cluster product intended to allow the user to generate a more detailed land cover product over smaller regions. Both products are available at 30 m spatial resolution as 1:250k National Topographic Data Base (NTDB) tiles in GeoTIFF format.

Most of the Landsat data forming the coverage were obtained from the Centre for Topographic Information (CTI) and from the Global Land Cover Facility (GLCF) portal at the University of Maryland. These data were radiometrically balanced using year-2000 SPOT VGT data following the procedure in Olthof et al (2005). Other data, forming the mosaic of Baffin Island for example, were radiometrically balanced by combining multiple paths of orthorectified Landsat data following the procedure in Gibson and Nedelcu (2008).

Sixteen individual radiometrically balanced large-area mosaics were created of Landsat bands 3 (Red), 4 (Near Infrared; NIR) and 5 (Shortwave Infrared; SWIR). Enhanced images were clustered to 200 spectral clusters using the Fuzzy K-means algorithm (Bezdek, 1973) and a pseudo-colour table. Spectral clusters were stratified by bioclimatic zone, geology and topography. Using existing land cover products generated over protected areas in the North, limited field and additional reference data found in the literature, lookup tables were generated to merge spectral clusters to the 15 classes. Land cover and cluster images were tiled to the 1:250k NTDB tiles, and manual quality control and editing were performed on land cover tiles to generate the final product (Figure 1).

The objective of this project is to improve existing algorithms and develop new ones which use Earth observation (EO) data to provide information for assessing land cover and land use change. The Northern Land Cover of Canada project is designed to meet the environmental information needs of public, private and educational organizations and also to support Canada's international commitments. It involves the development of comprehensive multi-scale datasets for national land cover and change detection.



Legend

I. Graminoid Dominated

Tussock graminoid tundra

Wet sedge

Moist to dry non-tussock graminoid / dwarf shrub tundra

Tussock graminoid tundra

II. Shrub Dominated (> 25% cover)

Low shrub (< 40cm; > 25% cover)

Tall shrub (> 40cm; > 25% cover)

Prostrate dwarf shrub

III. Sparse Vegetation (2 - 10% cover)

Sparsely vegetated bedrock

Sparsely vegetated till-colluvium

Bare soil with cryptogam crust - frost boils

IV. Wetlands

Wetlands

V. Non-Vegetated (< 2% cover)

Barren

Ice / snow

Shadow

Water