



Manaaki Whenua
Landcare Research

LCDB v4.1 - Land Cover Database version 4.1, Mainland New Zealand

Title

LCDB41_Upload

Creator

Landcare Research New Zealand Ltd

Date

2015-06-30

Description

The New Zealand Land Cover Database (LCDB) is a multi-temporal, thematic classification of New Zealand's land cover. It contains 33 mainland classes (35 including the offshore Chatham Islands). The classification has evolved from version to version but backward compatibility has been maintained. Geographic features are described by a polygon boundary, a land cover code, and a land cover name at each of four nominal time steps; summer 1996/97, summer 2001/02, summer 2008/09, and summer 2012/13. The data set is designed to complement in theme, scale and accuracy, Land Information New Zealand's 1:50,000 topographic database. LCDB is suitable for use in national and regional state-of-environment monitoring, forest and shrubland inventory, biodiversity assessment, trend analysis and infrastructure planning. The classification used in LCDB v4.1 is presented in the document 'LCDBClassesAtVersion4.1.pdf' and a table correlating LCDB classes over all four LCDB versions is presented in the document 'LCDBClassCorrelations.pdf'. Both of these documents are available as an attachment to this dataset in the LRIS portal (<https://lris.scinfo.org.nz/>) and on the LCDB project site (www.lcdb.scinfo.org.nz). LCDB v4.1 was released in July 2015 and includes corrections to all time steps 1996/97, 2001/02, 2008/09 and 2012/13. A description of work undertaken for this release (including that in all earlier releases) is presented in the Lineage section. Of particular note at 4.1 is the re-mapping of Chatham Islands - first mapped at version 2, but then not continued through versions 3.0, 3.3, and 4.0 because of resource constraints. "EditAuthority" and "EditDate" are attributes, maintained since version 3.0 to indicate authorship and nominal date of polygon mapping, edit or change. The data is referenced to the New Zealand Transverse Mercator 2000 projection (NZTM2000) which uses the NZ Geodetic Datum 2000 (NZGD2000). Errors in the data due to misclassification (not changes since mapping) or poor delineation can be reported to Landcare Research for inclusion in the next release using the online feedback mechanisms in <https://lris.scinfo.org.nz/>.

Source

LCDB v1 was created 'de novo' from classified SPOT satellite imagery with polygons either captured directly from the classified imagery or manually digitised. The modest classification of 16 LCDB v1 classes were considerably expanded to 43 classes for LCDB v2 and polygon boundaries were significantly re-drawn by manual digitising over LandSat 7 and ETM+ satellite imagery. Mapping of the second (2001/02) time step was informed by a 'difference layer' created by comparison between 1996/97 and 2001/02 imagery and an extensive field

checking phase sought to verify the mapping. LCDBs v3 and v4 consolidated and refined the mapping process by firstly rationalising the classification to 33 mainland classes (35 with Chatham Islands included), smoothing polygon boundaries to remove latent artifacts of the early raster mapping, and aligning the mapping with the standard topographic coastline. Improved imagery and image classification techniques, combined with resource limitations, prompted a decision to not undertake widespread field checking, but ancillary data and stakeholder reviews were built into the mapping workflow. Change mapping remained a manual, on-screen, process but was assisted by improved imagery difference detection, a variety of supporting imagery (including aerial photography), and accessory datasets (such as New Zealand's Kyoto Land Use mapping). The minimum mapping unit for the data is nominally 1 hectare. Polygons from earlier versions less than 1/10 hectare were removed. LCDB v3.0 undertook a 'rubber-sheet' correction of a mis-aligned area of mapping in South Westland / northern Otago, and mapped a new time step corresponding to summer 2008/09 using SPOT 5 satellite imagery acquired between November 2006 and October 2008. Some cloud affected areas were filled using Landsat or imagery from earlier dates. Satellite imagery was pan sharpened to 10m spatial resolution with terrain normalisation. Orthorectification was to the New Zealand Map Grid using photogrammetric software. Ground control points, used to position the imagery in the rectification process, were measured from aerial photography. Elevation models, used to correct distortion due to height, have 15m pixels and were generated from 20m contour data. Orthorectification met the target of 95% of the imagery being accurate within 5 metres r.m.s. error. Map updates were guided by an analysis of the new data identifying patches with spectral signatures inconsistent with the LCDB2 class. Operators then used visual interpretation and manual digitising techniques to re-map in the vicinity of identified inconsistencies. In addition to the new SPOT data, imagery from other dates before and after was viewed simultaneously to help make decisions on the correct class and what is likely happening on the ground. Higher resolution SPOT Maps data from 2008/09 was included in this image set. Harvested forest polygons at 2001 were reviewed and their new 2008 state entered and new forest harvesting at 2008 incorporated. Ancillary data such as digital topodata, aerial photography and published topomaps were used to assist in the interpretation of the imagery. Regional councils and the Department of Conservation reviewed the draft mapping and provided corrections for errors found in their areas of interest. An accuracy assessment on LCDB3.0 mapping was undertaken early in 2012 and results made available on the LRIS portal (<https://lris.scinfo.org.nz/>) and on the LCDB project site (www.lcdb.scinfo.org.nz). LCDB v3.3 is an improvement to LCDB3.0 as a result of five processes:

- A review of improbable land cover transitions, correcting those found in error
- A review of >20ha mapped land cover transitions between 2001/02 and 2008/09, correcting those found in error (some of these records were exposed as original error rather than recent-date change)
- Croplands and Settlements were reviewed and improved using recently updated Kyoto Land Use Mapping (refer <http://www.mfe.govt.nz/land/data-organisations/land-use-map#map>).
- A review of South Island tussock and low producing grasslands to delineate those which have undergone recent improvement (commonly, but not always, associated with dairy conversion)
- Correction of error (in classification or delineation) noticed in the vicinity of edits undertaken above and those notified by users

LCDB v4.0 introduced a fourth time step, land cover corresponding nominally to summer 2012/13 using SPOT 5 satellite imagery acquired between October 2011 and February 2013. In addition to 2008-2012 change mapping, further improvements were made through five other processes:

- Incorporation of high-quality wetland mapping of five Regions (Bay of Plenty, Taranaki, Manawatu-Wanganui, Wellington and Otago), and

one District (Far North) • Mapping of detected change between 2008/09 and 2012/13 including that associated with harvesting/replanting of production forests • Correction of error (in classification or delineation) noticed in the vicinity of edits undertaken above and those notified by users • Incorporation of new urban development not detected by the change analysis above but recorded in the LINZ core record system (cadastral) database LCDB v4.1 is an improvement to LCDB v4.0 as a result of three processes: • Significant contradictions in woody land covers between LCDB v4.0 and 2012 Kyoto Land Use Mapping were investigated and, where necessary, corrections made - these mainly represented indigenous/exotic and forest/scrub confusions. • Unmapped woody vegetation patches in grassland polygons were detected by spectral methods verified with radar (ALOS PALSAR) analysis, and incorporated in a semi-automated process. • Error-correction arising from user feedback and limited 'green field mapping' improvements were made during and following the foregoing processes. The data set has been captured and is stored in digital ArcGIS file Geodatabase and ESRI Shapefile format with an internal database structure storing the attribute data. The data has been built for polygon topology and has been checked for duplication and anomalies within the data.

Coverage

-47.421639 166.262038 -34.008229 179.501385

Identifier

<https://iris.scinfo.org.nz/layer/48423-lcdb-v41-land-cover-database-version-41-mainland-new-zealand/>

Type

vector

Subject

inlandWaters

Subject

environment

Subject

farming

Subject

biota

Subject

imageryBaseMapsEarthCover

Subject

planningCadastre

Subject

New Zealand

Subject

Herbaceous Saline Vegetation

Subject

Gravel and Rock

Subject

Exotic Forest

Subject

Permanent Snow and Ice

Subject

Estuarine Open Water

Subject

| Fernland
Subject
| Depleted Grassland
Subject
| Tall Tussock Grassland
Subject
| High Producing Exotic Grassland
Subject
| Alpine Grass/Herbfield
Subject
| Built-up Area (settlement)
Subject
| Transport Infrastructure
Subject
| Sub Alpine Shrubland
Subject
| Sand and Gravel
Subject
| Broadleaved Indigenous Hardwoods
Subject
| Herbaceous Freshwater Vegetation
Subject
| Deciduous Hardwoods
Subject
| Mangrove
Subject
| Short-rotation Cropland
Subject
| Forest - Harvested
Subject
| Gorse and/or Broom
Subject
| Surface Mines and Dumps
Subject
| Lake or Pond
Subject
| River
Subject
| Matagouri or Grey Scrub
Subject
| Low Producing Grassland
Subject
| Orchard Vineyard & Other Perennial Crops
Subject
| Mixed Exotic Shrubland
Subject
| Landslide
Subject

| Urban Parkland/Open Space

Subject

| Indigenous Forest

Subject

| Flaxland

Subject

| Manuka and/or Kanuka

Subject

| Dune Shrubland

Subject

| Peat Shrubland

Subject

| 1996, 2001, 2008, 2012, 1996/97, 2001/02, 2008/09, 2012/13

Subject

| Vegetation, Wetland, Agriculture, Forest, Environment, Land Cover, Land Use

Subject

| Downloadable Data