

NZTopo

Technical information about the NZTopo database. Find out about other [LINZ datasets](#).

Object orientated data model

NZTopo uses an object orientated (OO) data model. Real world entities are abstracted and held as objects where each object belongs to only one class. The OO database more closely resembles the real world. The "information model" it uses is necessarily more complex than the collection of tables in a relational system.

The advantage of the object model is in the direct correspondence between the way in which real entities are perceived, and the data model designed to represent them.

Real-world entities and abstract concepts can be modelled in terms of their shape, behaviour, location, relationships with other objects, and other properties.

The user must grasp a number of new concepts in order to understand the OO database model:

- **Objects and Classes:** Objects are grouped into classes.
- **Values:** Values (attributes) may be defined for each class of object. The term value refers to the information that can be retrieved for a given object.

Technical Information

NZTopo data

Data Storage: NZTopo is stored in Laser-Scan's GOTHIC Lamps2 (<http://www.lsl.co.uk>) Geographic Information System (GIS).

- **Database size:** The current size of the New Zealand component of the Database is approximately 12 Gigabytes.
- **Number of features:** Approximately 7,500,000 real world objects make up the 280 feature types that populate this Database.
- **Source data:** NZTopo base data was scanned from the colour separations used in the production of the Topographic Map 260 Series 1: 50 000 scale.
- **Completeness:** Spatial and attribute data capture is complete. Data currency is being maintained on a 260 sheet basis from digital orthophotography.
- **Accuracy:** NZTopo data complies with the following statement of planimetric (x,y) accuracy – "90% of well-defined points are within +/- 22metres". NZTopo data complies with the statement of vertical (z) accuracy – "90% of well-defined points are within +/- 10 metres".

LSLIFF data format

LINZ supplies digital topographic vector data in LSLIFF format only. This simple ASCII file transfer format is a textual expansion of the propriety format of [1Spatial](#) LAMPS software. It can be read and written by the LAMPS2 software used by LINZ for NZTopo.

LSLIFF topographic data comprises geographical features, where each feature must have co-ordinates and may have attributes. Each system object output therefore is written as an LSLIFF feature, with its co-ordinates and properties translated into LSLIFF co-ordinates and properties.

An LSLIFF file consists of a series of 'Entries', usually one entry per text line. Each entry starts with a two-letter code indicating the entry type. The file starts with a series of entries describing the file contents (File Level Entries). This is followed by one or more 'Sections', containing one or more 'Layers', with each layer containing multiple 'Features'.

Start of File

- RA Coordinate Range - this is the first entry in the file.
- HI History - empty history entry indicates that modern IFF file is created
- NS new section - this entry contains the identification string specified by the identification string parameter.
- NO New Overlay - this entry takes the form: NO overlay-number. Only one overlay (layer) will usually be present in LINZ data

Object Output

- NF New Feature – the feature serial number and internal sequence number are allocated numbers sequentially, starting at 1.
- FS - always follows the NF entry - this entry takes the form: FS fc int2 int3 int4. Int2 to int4 will normally be zeros. The fc is an integer feature code used to indicate which class the object belongs to. See the Data Documentation Guide of the NZTopo Data Dictionary for the NZTopo Object Code List.
- AC - Ancillary Code (or Attribute code) follows the FS entry. See the Data Documentation Guide of the NZTopo Data Dictionary for the NZTopo Attribute List. It is followed by an integer giving the attribute type, a numeric value (integer or real), and may have a textual value enclosed in double quotes.
- ST- Coordinate String
- RO - Rotation may occur within text, orientation symbol, and is an angle in radians
- EF - End of Feature - this must be present at the end of every feature.

End of File

- EO - must be present at the end of every layer
- EM – End of Map
- EJ End of Job (or file) - this is the last entry in the file

An example of a Laser-Scan IFF Transfer Format

```
RA 2481000.000000 2485000.000000 5763000.000000 5767000.000000
HI
NS IFF text file created by Translate
NO 44074256
NF 1 1
FS 85 0 16384 0
AC 1123 0 "Woodend"
AC 1056 0 "POPL"
ST 1 0
2482295.100000 5765386.400000
RO 0.000000
EF
NF 2 2
FS 9 0 0 0
AC 1002 0 " "
AC 1003 0 " "
ST 4 0
2481000.000000 5763845.341926
2481013.900000 5763844.200000
2481011.200000 5763812.300000
2481000.000000 5763813.222727
EF
EO
EM
EJ
```