

NZ Meshblocks (2013 Census)

Title

Meshblock 2013, High Definition, Full

Description

Statistics New Zealand maintains an annual meshblock pattern for the collection and production of statistical data, allowing data to be compared over time. A meshblock is the smallest geographic unit used by Statistics New Zealand for which statistical data is collected and processed by statistics New Zealand. A meshblock is defined by a geographic area, varying in size from a part of a city block to large areas of rural area. Each meshblock abuts against another to form a network covering all of New Zealand, including coasts and inlets and extending out to the 200 mile economic zone. Meshblocks are added together to build up larger geographic areas such as area units and urban areas. They are also the principal unit to draw and define electoral districts, territorial authorities and regional councils.

Meshblocks are allocated a unique seven-digit number. The first 5 digits are unique, and refer to the original 1976 meshblock code. The two end numbers refer to sequential meshblock splits to the original meshblock. When a meshblock is split the final two digits of the original meshblock number are changed. Exceptions to this rule are a small number of meshblocks where there are no more numbers in the sequence are available. There are therefore some meshblocks in Auckland and Tauranga City starting with 32xxxx. Statistics New Zealand maintains a concordance file to ensure that boundaries relating to earlier meshblock patterns can also be generated.

There are two ways of amending meshblock boundaries.

1. - Splitting is the subdivision of a meshblock into two or more meshblocks.
2. - Nudging is the shifting of a boundary to a more appropriate position.

The reasons for splits and nudges include:

- - to accommodate changes to local government boundaries, which are required by the Local Government Act 2002 to follow meshblocks for electoral purposes.
- - to accommodate changes to parliamentary electoral boundaries, following each Electoral Representation Commission review after each five yearly Census of Population and Dwellings
- - to make changes to statistical boundaries such as area units and urban areas
- - to enable changes to census collection districts
- - to improve the size balance of meshblocks in areas where there has been population growth
- - to separate land and water eg mainland, islands, inlets, oceanic are defined separately
- - to accommodate requests from other users of the meshblock pattern eg Police for their station, area and district boundaries

The dataset is intended for use in the display and presentation of statistical and other data to show areas of high or low density and distributions for comparative purposes over time. The digital boundaries are defined by Statistics New Zealand. They are maintained on behalf of Statistics New Zealand by Land Information New Zealand in Landonline using ArcInfo.

Meshblocks cover the land area of New Zealand, the water area to the 12 mile limit, Chatham Islands, the Kermadec Islands, off-shore oil rigs, Ross Dependency and extend to the 200 mile economic zone. The meshblocks for the last four mentioned areas have not been digitised. The 12 mile limit is digitised.

Meshblock boundaries generally follow street centre-lines, cadastral property boundaries or topographical features (eg rivers). Expanses of water in the form of lakes and inlets are defined separately from land.

The annual pattern of digital boundaries is used for the full calendar year from 1 January and applies to the timing of the survey –not necessarily when the data is processed.

The following table depicts the total numbers of meshblocks since 1990 when meshblocks were digitalised.

Year Meshblock Totalsof NZ Digitised Meshblock Totals

1990	34882	34876
1991	35152 (Census)	35146
1992	35163	35157
1993	35370	35364
1994	35584	35578
1995	36235	36228
1996	36808 (Census)	36801
1997	36808	36801
1998	36829	36822
1999	37154	37147
2000	37383	37367
2001	38366 (Census)	38350
2002	38378	38362
2003	38685	38669
2004	39313	39297
2005	39819	39803
2006	41392 (Census)	41376
2007	41512	41496
2008	42982	42966
2009	43940	43924
2010	46252	46236
2011	46627	46611
2012	46632	46616
2013	46637	46621

As at 1st July 2007, Digital Boundary data became freely available.

Lineage

The digital meshblock boundaries are stored and maintained by Land Information New Zealand within

their landonline database, and ArcInfo Suite.

Statistics New Zealand maintains the meshblock pattern by checking the cadastral pattern against the meshblock pattern via LINZ's Landonline and Terralink International Limits licensed software, Terraview platinum. Non-alignment of meshblock and cadastral boundaries are one of a number of reasons for meshblock boundary adjustments. Other reasons include requests from local authorities, Local Government Commission, Electoral Representation Commission and to make Census of Population and Dwellings enumeration processes easier.

Once all changes are prepared, Statistics NZ then passes the requests for changes to the meshblock pattern onto LINZ for the electronic changes to take place.

To Derive the area unit boundaries clipped to the coastline, meshblock polygons were dissolved to include or exclude land/water attributes attached to each meshblock.

From the generalised meshblock pattern, higher geographies, were dissolved using the dissolve tool in the Arc GIS suite to create multiple output datasets.

Output files

Community Boards are set up under the Local Government Act 2002 and Local Electoral Act 2001. Their purpose is to administer the affairs of communities with populations not less than 1,500 within rural, urban or metropolitan districts of a territorial authority. A community boards functions, powers and duties are delegated at the discretion of its parent territorial authority and these may differ from community board to community board. Community boards and their boundaries are reviewed in the year immediately preceding the triennial local government elections.

Community Boards are numbered based on their corresponding territorial authority. Each community board has a unique five digit number. The first three digits are the territorial authority that the community board lies within. The following two digits are sequential, and represent the number of community boards within the territorial

authority. For example, Taupo District (021) has 1 community board numbered 02101. The rest of the district is not represented by a community board boundary and is therefore coded 02199.

Many territorial authorities do not have community boards and if they do, the community boards do not necessarily cover the whole territorial authority.

As at 1st July 2007, Digital Boundary data became freely available.

Deriving of output Files

The original vertices delineating the meshblock boundary pattern were digitised in 1991 from 1:5,000 scale urban maps and 1:50,000 scale rural maps. The magnitude of error of the original digital points would have been in the range of +/- 10 metres in urban areas and +/- 25 metres in rural areas. Where meshblock boundaries coincide with cadastral boundaries the magnitude of error will be within the range of 1-5 metres in urban areas and 5 - 20 metres in rural areas. This being the estimated magnitude of error of Landonline.

The creation of high definition and generalised meshblock boundaries for the 2013 digital pattern and the dissolving of these meshblocks into other geographies/boundaries were completed within Statistics New Zealand using ESRI's ArcGIS desktop suite and the Data Interoperability extension with the following process:

1. Import data and all attribute fields into an ESRI File Geodatabase from LINZ as a shapefile
2. Run geometry checks and repairs.

3. Run Topology Checks on all data (Must Not Have Gaps, Must Not Overlap), detailed below.
4. Generalise the meshblock layers to a 1m tolerance to create generalised dataset.
5. Clip the high definition and generalised meshblock layers to the coastline using land water codes.
6. Dissolve all four meshblock datasets (clipped and unclipped, for both generalised and high definition versions) to higher geographies to create the following output data layers: Area Unit, Territorial Authorities, Regional Council, Urban Areas, Community Boards, Territorial Authority Subdivisions, Wards Constituencies and Maori Constituencies for the four datasets.
7. Complete a frequency analysis to determine that each code only has a single record.
8. Re-run topology checks for overlaps and gaps.
9. Export all created datasets into MapInfo and Shapefile format using the Data Interoperability extension to create 3 output formats for each file.
10. Quality Assurance and rechecking of delivery files.

The High Definition version is similar to how the layer exists in Landonline with a couple of changes to fix topology errors identified in topology checking.

The following quality checks and steps were applied to the meshblock pattern:

Translation of ESRI Shapefiles to ESRI geodatabase dataset

The meshblock dataset was imported into the ESRI File Geodatabase format, required to run the ESRI topology checks. Topology rules were set for each of the layers.

Topology Checks

A tolerance of 0.1 cm was applied to the data, which meant that the topology engine validating the data saw any vertex closer than this distance as the same location. A default topology rule of "Must Be Larger than Cluster Tolerance" is applied to all data – this would highlight where any features with a width less than 0.1cm exist. No errors were found for this rule.

Three additional topology rules were applied specifically within each of the layers in the ESRI geodatabase – namely "Must Not Overlap", "Must Not Have Gaps" and "'Area Boundary Must Be Covered By Boundary Of (Meshblock)". These check that a layer forms a continuous coverage over a surface, that any given point on that surface is only assigned to a single category, and that the dissolved boundaries are identical to the parent meshblock boundaries.

Topology Checks Results:

There were no errors in either the gap or overlap checks.

Generalising

To create the generalised Meshblock layer the "Simplify Polygon" geoprocessing tool was used in ArcGIS, with the following parameters:

Simplification Algorithm: POINT_REMOVE

Maximum Allowable Offset: 1 metre

Minimum Area: 1 square metre

Handling Topological Errors: RESOLVE_ERRORS

Clipping of Layers to Coastline

The processed feature class was then clipped to the coastline. The coastline was defined as features within the supplied Land2013 with codes and descriptions as follows:

11- Island - Included

12- Mainland - Included

21- Inland Water - Included

22- Inlet - Excluded

23- Oceanic -Excluded

33- Other - Included.

Features were clipped using the Data Interoperability extension, attribute filter tool. The attribute filter was used on both the generalised and high definition meshblock datasets creating four meshblock layers. Each meshblock dataset also contained all higher geographies and land-water data as attributes.

Note: Meshblock 0017001 which is classified as island, was excluded from the clipped meshblock layers, as most of this meshblock is oceanic.

Dissolve meshblocks to higher geographies

Statistics New Zealand then dissolved the ESRI meshblock feature classes to the higher geographies, for both the full and clipped dataset, generalised and high definition datasets. To dissolve the higher geographies, a model was built using the dissolver, aggregator and sorter tools, with each output set to include geography code and names within the Data Interoperability extension.

Export to MapInfo Format and Shapfiles

The data was exported to MapInfo and Shapefile format using ESRI's Data Interoperability extension Translation tool.

Quality Assurance and rechecking of delivery files

The feature counts of all files were checked to ensure all layers had the correct number of features. This included checking that all multipart features had translated correctly in the new file.

Identifier

<https://koordinates.com/layer/8578/>

Language

eng