Development and use of an electronic gazetteer with open-source technologies

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• Background
  • New Zealand Geographic Board supported by Land Information New Zealand
  • Government supports open data and open-source technology
  • Legal requirement to publish official place name decisions

• The Gazetteer system
• Database and servers
• QGIS and Plugin
• Gazetteer webapp
• Distribution
• Lessons learned
• Next Steps
• Questions
Background

- Decisions historically communicated through Lands and Survey maps
- Some one-off print Gazetteers 1934, 1968
- Spreadsheets used during late-2000s, published online as PDFs
Timeline

1968
- Print Gazetteer published
- New Zealand Geographic Board Act 1946

Late 2000s
- Compiling the Gazetteer
- Spreadsheets and PDFs

2010–2013
- Gazetteer system planning and development
- PostgreSQL, QGIS, LINZ data service, public webapp

2010–2013
- Webapp redevelopment
- Published to Github

2016–2018
- Webapp enhancements - base maps, layers, options

2020
- QGIS plugin upgrade
- Webapp fixes

2020
- Multi-version database upgrade
- New server software and hardware

2021/22
Database and servers
Database and servers

- PostgreSQL database with PostGIS for spatial objects
- Synchronised independent disaster recovery server and database
- Separate test server and database
- Connection via PGAdmin for direct query, bulk updates, etc
- Recently completed a multi-version update to server and database software, new server hardware
QGIS and plugin
For QGIS 3.xx – plugin essentially GUI (graphical user interface) to database

Direct database connection. Can edit tables and geometry and manage administration in the database such as valid users

Migration of plugin from QGIS 2->3 and Python 2->3 in 2020

Built on Python 3 and JSON (JavaScript Object Notation)

Code managed, made open and shared on Github
Gazetteer webapp
The public / general audience facing piece of the system

Rebuilt 2016-18 on its own website, replacing a very basic search/view window, embedded on the LINZ website

Built with open-source React and Redux JavaScript on the Leaflet platform

Ruby on Rails backend, connects to database with Docker

Source code freely available (part of contract with developers)

Big enhancements 2019, smaller ongoing bug-fixes
Distribution
Distribution

- Published Gazetteer data available from the LINZ Data Service (data.linz.govt.nz) in many projections and various formats - both open (eg Geopackage) and proprietary (eg the common Shape file)
- Management of the ISO 19115/ANZLIC metadata standards and Open Geospatial Consortium standards handled through the platform
- WFS services and changeset services available for linked data
- Freely available under a CC BY 4.0 licence
- Basic .CSV downloads also available from the wep application, including one for macrons, diacritics mark in te reo Māori
Lessons learned

• Keeping current is key – ensure support arrangements are in place from the start
• Cost of system – while software is free, building the system, maintaining servers and ongoing support is not. A modular system could mean more overheads
• Upskilling – new skills for new systems
Who uses Gazetteer data?

- Official documents such as maps charts, and signs are legally required to use official names.
- Other uses include:
  - Compliant search functionality for LINZ applications
  - Reference sources for Wikipedia
  - Spatially referencing against authoritative names, eg Antarctica New Zealand’s image library
  - Third party cartography and digital mapmaking
  - Researchers – eg historians, linguists
Next steps

- Ongoing support
- New base maps from Toitū Te Whenua LINZ
- Second rebuild of the web application
- APIs and embedding?
- A cloud-based system?
- Emphasis on promoting the Gazetteer, greater integration across government, Crown agencies - and perhaps the GLAM* sector too?

*GLAM – Galleries, Libraries, Archives, Museums