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Country Report of New Zealand *

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Toitu te Land whenua Information New Zealand

New Zealand Country Report

For the First High-Level Forum on Global Geospatial Information Management

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Report Summary

This report outlines the strategic framework for geospatial information in New Zealand - the New Zealand Geospatial Strategy. Initially some New Zealand contextual information is given for overseas readers. The report then describes the Geospatial Strategy's vision, purpose, key principles, goals and related activities.

The importance of a national spatial data infrastructure (SDI) is emphasised. Details are given of the recently published New Zealand SDI Cookbook which includes input from industry providers about how their products use open geospatial standards.

Examples are also provided of New Zealand online geospatial systems that increasingly include SDI-compliant web services. Many of these systems are implemented by New Zealand geospatial companies, some of whom also operate outside New Zealand.

Regional and international cooperation in using geospatial information is important and comments are included on New Zealand's contributions in this respect. Finally, the report presents some challenges that relate to the use of geospatial information and realising its value in better decision-making and ultimately better outcomes for people.

New Zealand Context

As can be seen from the globe above, New Zealand does not have many close neighbours. Australia, the Pacific region and Asian countries are our nearest partners for business and trade.

Here are some brief details about New Zealand's background to give international readers some context:

- 4.2 million population (68% European, 15% Maori, 9% Asian, 7% Pacific Islanders, 1% other)
- 270,000 square kilometres land area (over 2.5 times the land area of the Republic of Korea)
- Parliamentary elections every three years
- Two official languages – English and Maori
- First Maori (indigenous people) in New Zealand (Aotearoa) – 700 years ago
- First European explorers find New Zealand – 1642 (Tasman) & 1769 (Cook)
- New Zealand economy – based on agricultural/horticultural exports, value added services, tourism
- One third of New Zealand is protected conservation areas.

New Zealand Geospatial Strategy

The New Zealand Geospatial Strategy[1] was approved by the New Zealand Cabinet in late 2006 and its vision is:

"Trusted geospatial information that is available, accessible, able to be shared and used to support the:

- safety and security of New Zealand
- growth of an inclusive, innovative economy and
- preservation and enhancement of our society, culture and environment."

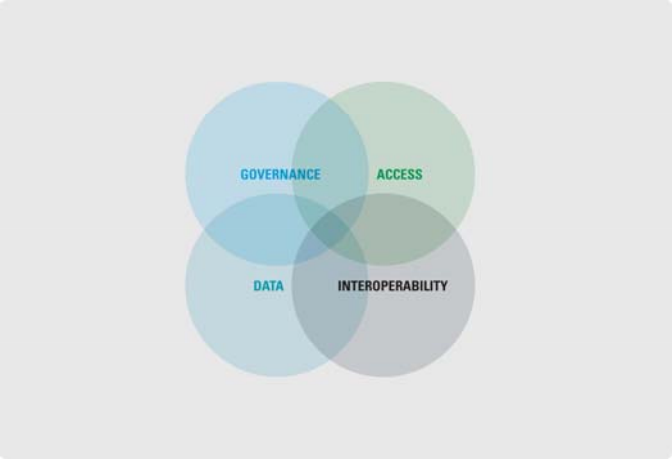
This Strategy provides the principles, goals and governance structure required to achieve the vision. It aims to:

- define the approach needed to ensure New Zealand's geospatial information infrastructure meets the ongoing business needs of government
- provide the framework for the leadership and direction needed for managing geospatial information
- optimise the collective benefit from public investment in geospatial infrastructure
- ensure quality fundamental (i.e. priority) geospatial data is available to all.

The following principles guide decision-making for achieving the vision:

- geospatial information is collected once to agreed standards to enable use by many
- discovery and access of geospatial information is easy
- within the appropriate context, geospatial information is easy to understand, integrate, interpret and use
- geospatial information that government needs is readily available, and its use is not unduly restricted, and
- geospatial content is appropriately preserved and protected.

The four strategic goals to achieve the vision as shown in the diagram below are:



[1] http://www.geospatial.govt.nz/geospatial-strategy/

- **Governance** - establish the governance structure required to optimise the benefits from government's geospatial resources
- **Data** - ensure the capture, preservation and maintenance of fundamental (i.e. priority) geospatial datasets, and set guidelines for non-fundamental geospatial data
- **Access** - ensure that government geospatial information and services can be readily discovered, appraised and accessed
- **Interoperability** - ensure that geospatial datasets, services and systems owned by different government agencies and local government can be combined and reused for multiple purposes.

The report now goes on to describe some of the related activities for each of these Strategy goals.

Governance

The Geospatial Executives Group (GEG) sets the ongoing strategic direction for the work programme of the Strategy. The Group is comprised of central and local government Chief Executives as well as industry partners.[2] The Geospatial Steering Committee (GSC) comprises representatives from central and local government at General Manager level to oversee the work programme. The New Zealand Geospatial Office (NZGO) was established within Land Information New Zealand (LINZ) to coordinate the implementation of the work programme.

A significant piece of work in the programme was a study to show the value of geospatial information to the New Zealand economy. This economic report was published in 2009.[3] It showed that the value of geospatial information to the New Zealand economy was in the order of NZ$1.2 billion per year. It also concluded that if key barriers to the use of geospatial information were removed then additional value in the order NZ$500 million could be gained. The report's main recommendation in order to gain this extra value was to develop a national spatial data infrastructure (SDI).

Subsequently, a paper was put to Cabinet in late 2010 entitled *Capturing economic benefits from location-based information*. Cabinet agreed in the paper to the development of a national SDI for New Zealand, and directed government agencies to become involved at the development stage. Cabinet also mandated Land Information New Zealand, through the NZGO, to assume a leadership role in driving the development of this infrastructure.[4]

New Zealand's SDI will be a foundation. The data infrastructure must be augmented by a wider range of geospatial tools and applications that will create and maintain the spatial data, and then provide the analysis, integration and visualization functions needed to deliver business capabilities. The more holistic integration of hardware, software, professionals, organisation and data is a geographic information system (GIS). The maturity level of GIS within an organisation is often a reflection of how important geography is as a part of policy making, decision support and operations.

The design and implementation of a national SDI represents an ongoing journey which will move New Zealand from an 'introductory' state, with a focus on adoption and increased participation, through to a 'formal' or institutionalised SDI where participation is widespread and the emphasis is on improving the components and benefits of that involvement. Some of the pieces of work related to this development are described below under the other Strategy goals: data, access and interoperability.

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[2] The Chair of the New Zealand Spatial Industries Business Association (SIBA) and the Executive Director of the New Zealand Information and Communication Technologies Group (NZICT).
[3] http://www.geospatial.govt.nz/productivityreport/
[4] The Cabinet paper and decision are available at http://www.linz.govt.nz/geospatial-office/about/projects-and-news/spatial-data-infrastructure/index.aspx

You can watch a video about the value of a New Zealand SDI at the following link – NZ SDI video.

Data

A priority in terms of the Strategy data goal has been to confirm stewardship and custodianship responsibilities for key geospatial datasets.

Stewardship is the act of ensuring that appropriate data management policies and standards are developed and maintained on behalf of the Crown. Stewardship covers all aspects of managing spatial information. This includes data architecture, quality, metadata, pricing, licensing, access and dissemination, bearing in mind any statutory responsibilities and government data management policies. Custodianship of spatial information is the act of ensuring appropriate care in the collection, storage, maintenance and supply of the information.

The over-arching principle is that stewards are formally appointed and responsible for engaging with the user community to ensure that the dataset is created and maintained to an agreed quality, using an agreed data specification and that the data is easy to find and use.

The Geospatial Steering Committee has agreed on the following fundamental reference data themes:

- **Geodetic Network** - Control points, Height datum, Geoid model, Map grid system
- **Cadastre** - Property boundaries, Land title reference
- **Address -** Physical address, Allocated address, Postal address
- **Transportation networks** - Road/track (including bridges and tunnels), Rail, Air and Water networks
- **Geographic names -** Official and Local place names
- **Elevation** - Digital elevation model, Spot heights, Contours, Bathymetry
- **Imagery** - Aerial and satellite photography, orthophotography, infra red imagery
- **Administrative units** - Jurisdictional areas for Local and Central governance
- **Hydrography** - Coastline, Inter-tidal zone, sea area
- **Hydrology** - Inland water features (lakes, dams, rivers etc)
- **Culture** - Built up areas, homesteads, wells, fences, towers, other as-built infrastructure
- **Vegetation** - forested areas etc (not land use)
- **Natural Features** - glaciers, geothermal areas, volcanoes, sand dunes etc

Each data theme above contains a number of datasets. The initial priority datasets that have been identified for improvement are:

- Parcel Boundaries (Cadastre theme – LINZ custodian)
- Physical Roads (Transportation networks theme – New Zealand Transport Authority custodian)
- Aerial and satellite photography and orthophotography (Imagery theme – LINZ custodian).

Access

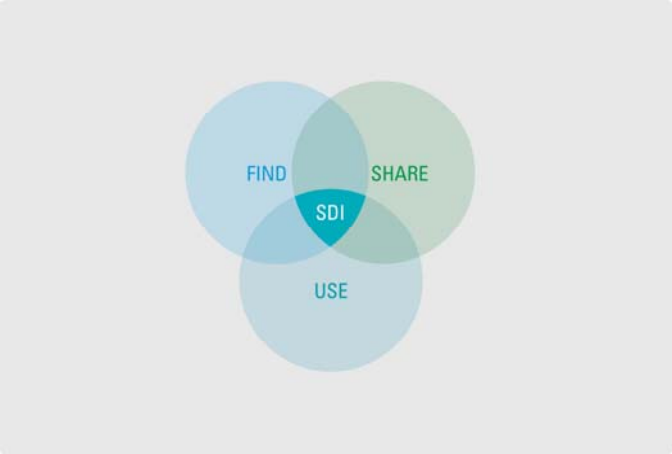
The Strategy access goal and the development of an SDI also align with broader government initiatives like the cross-government open information and data work programme, led by the Data and Information Re-use Chief Executives Steering Group. This programme is giving effect to Direction Two: Support Open and Transparent

Government of the Directions and Priorities for Government ICT, approved by Cabinet in October 2010[5]. The three priority areas of this Direction are to: improve public access to government data and information; support the public, communities and business to contribute to policy development and performance management; and create market opportunities and services through the re-use of government data and information.

The Data and Information Re-use programme has drafted New Zealand Data and Information Management Principles[6] which were approved by Cabinet in August 2011. In summary, the principles state that government data and information should be open, readily available, well managed, reasonably priced and re-usable unless there are necessary reasons for its protection. Personal and classified information will remain protected. Government data and information should also be trusted and authoritative.

The access to geospatial information is becoming easier as government agencies increasingly use standard Creative Commons licences under the New Zealand Government Open Access Licensing (NZGOAL) framework.[7]

Improving access to geospatial information through the development of an SDI is firmly based on the concept of 'Find, Share, Use' as shown in the diagram below.



The NZ Geospatial Office is developing a Geospatial Catalogue[8] using open source software that will allow users to find information (metadata) about geospatial datasets. Discussions are ongoing about integrating this geospatial domain catalogue more closely with the more general government dataset catalogue[9] for the Data and Information e-use programme.

Interoperability

The Strategy interoperability goal will ensure that geospatial datasets, services and systems owned by different government agencies can be shared, combined and reused for multiple purposes.

In support of this goal a New Zealand SDI Cookbook has been published to provide guidance.[10] The material included in the initial release of the Cookbook has come from

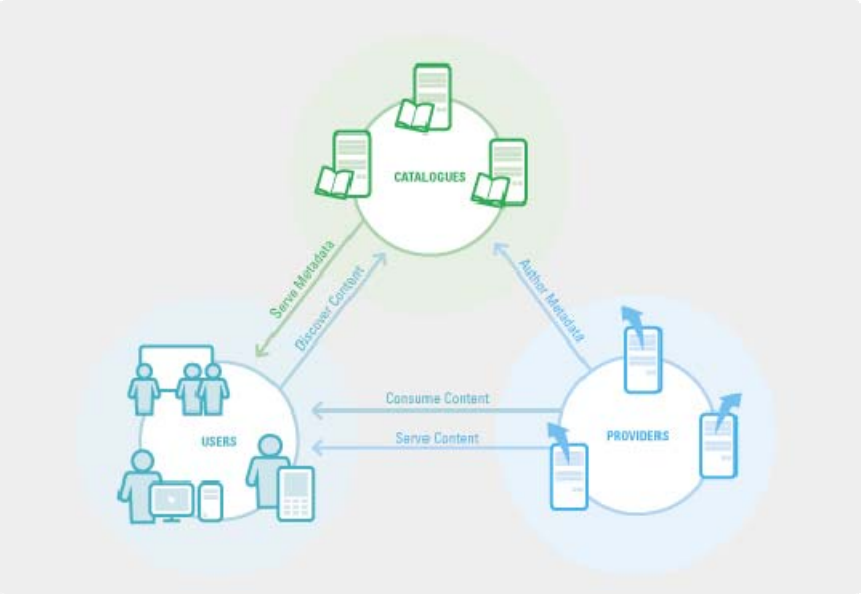
[5] http://www.dia.govt.nz/Directions-and-Priorities-for-Government-ICT
[6] http://ict.govt.nz/programme/opening-government-data-and-information/new-zealand-data-and-information-management-princi
[7] http://ict.govt.nz/guidance-and-resources/information-and-data/nzgoal
[8] http://www.geodata.govt.nz
[9] http://www.data.govt.nz
[10] http://www.geospatial.govt.nz/sdi-cookbook-home

NZ Geospatial Office staff together with input from other central government agencies, local authorities, academia, members of the open data community and private sector SDI consultants.

Other material in the Cookbook explains how organisations and their supporting systems can participate in SDI. Systems participate in one of three ways:

- They can contribute to SDI by providing services of geospatial information. These systems are then acting as 'Provider Nodes'
- They can contribute to SDI by providing catalogues of geospatial information. These systems are then acting as 'Catalogue Nodes'
- They can benefit from SDI by utilising the catalogues and services of geospatial information. These systems are 'User Nodes'

The relationship between different nodes is shown in the diagram below:



Systems participate in SDI by having certain characteristics that create interoperability with other nodes. That interoperability is enabled through the use of well-defined and open international standards.

The Cookbook in its current form is designed to provide context and guidance for the introductory phase of the SDI, describing minimum requirements to foster increased participation. As the NZ SDI evolves to a more formal state, the cookbook will also change to reflect guidance befitting a more mature implementation. The primary audience therefore for the release of the Cookbook comprises government agencies, local councils and other organisations seeking to participate in the national SDI who are currently at the early stages of that journey.

Included in the Cookbook is guidance on how organisations can support the national SDI through the use of open geospatial standards, and how those standards can increase the effectiveness of that support. Chapter 6 of the Cookbook is material contributed from application providers about how their applications conform with open geospatial standards.

Examples

Examples are provided below of New Zealand online geospatial systems that increasingly include SDI-compliant web services. Many of these systems are implemented by New Zealand geospatial companies, some of whom also operate outside New Zealand.

LINZ Data Service

LRIS – Environment and Land Data from Landcare Research

Auckland City Council viewer

Wellington City Council

Christchurch Recovery viewer

Walking Access Mapping System

New Zealand companies which supply geospatial related services outside New Zealand include:

Beca

Critchlow

GNS Science

Landcare Research

LandZone International

NIWA

NZ Aerial Mapping Ltd

NorthSouth GIS NZ

Terralink International

TracMap NZ Ltd

For a list of New Zealand geospatial consultants contact the SIBA Secretary at – secretary@siba.org.nz

Regional and International Cooperation

New Zealand is a member of the Australia New Zealand Land Information Council (ANZLIC)[11] and is represented on the Council by the Chief Executive of LINZ. ANZLIC is a joint initiative of the Australian and New Zealand Governments, and the State and Territory Governments of Australia.

[11] http://www.anzlic.org.au/

There can be many barriers to information access such as organisational boundaries between agencies, jurisdictions and nations; lack of consistent information standards; and use of incompatible or inappropriate technologies. ANZLIC is encouraging development of consistent government policies within Australia and New Zealand to minimise these barriers wherever possible and is working with all government jurisdictions and the private sector to develop policies and guidelines which adopt international best practice which is relevant to conditions found by practitioners and users of spatial information in both countries.

A key ANZLIC initiative is the Australia New Zealand Spatial Marketplace demonstrator (ANZSM). This is a demonstrator which is being built in an open source environment on the OpenGeo suite and will be an umbrella market place that can link all existing datasets. Other work is carried out by a standing committee of ANZLIC - the Intergovernmental Committee for Surveying and Mapping (ICSM)[12].

A number of New Zealand government agencies and private companies are also members of the Cooperative Research Centre for Spatial Information (CRCSI)[13]. The CRCSI is a joint venture of Australian and New Zealand government, academic and private sector organisations using spatial technologies to solve complex problems of national significance.

New Zealand also contributes to a number of global initiatives and professional associations related to geospatial information:

- International Hydrographic Organisation (IHO)
- International Federation of Surveyors (FIG)
- International Cartographic Association (ICA)
- International Association of Geodesy (IAG)
- Group on Earth Observations (GEO)
- International Society for Digital Earth (ISDE)
- International Standards Organisation (ISO)
- Open Geospatial Consortium (OGC)
- International Steering Committee for Global Mapping (ISCGM)
- United Nations Regional Cartographic Conferences for Asia-Pacific (UN-RCCAP)
- United Nations Group of Experts for Geographic Names (UNGEGN).

Challenges

There are a number of challenges that relate to the use of geospatial information and realising its value in better decision-making and ultimately better outcomes for people. Among the key challenges for New Zealand in this area are:

- Implementing a national spatial data infrastructure in a time of fiscal constraint and limited resources
- Explaining in relevant terms to a variety of audiences, the value of using geospatial information for example to improve business processes and decisions, improve government collaboration, decision-making and increase public participation.
- Building capability to capture the benefits of available geospatial information.

[12] http://www.icsm.gov.au/
[13] http://www.crcsi.com.au/Home

Further Information

New Zealand Geospatial Strategy website - www.geospatial.govt.nz

New Zealand Geospatial Office contact – nzgo@linz.govt.nz