



The development of a modern geodetic system in New Zealand

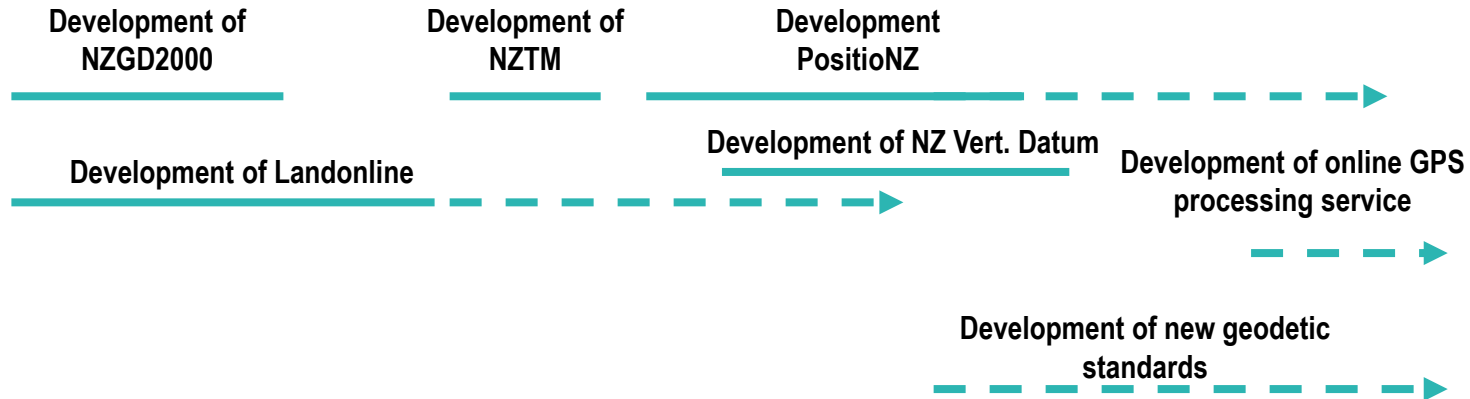
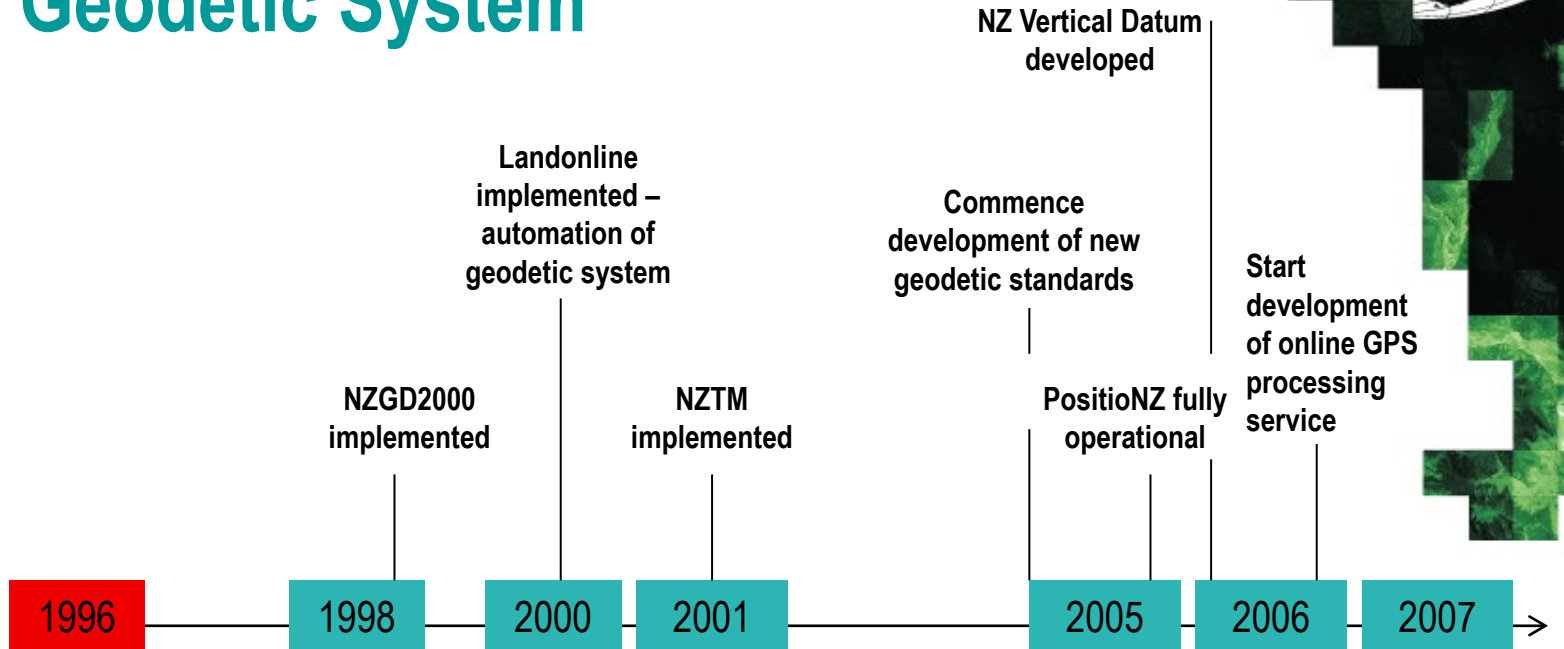
GRAEME BLICK and NIC DONNELLY

Customer Services - Geodetic

Major milestones in the development of the NZ Geodetic System

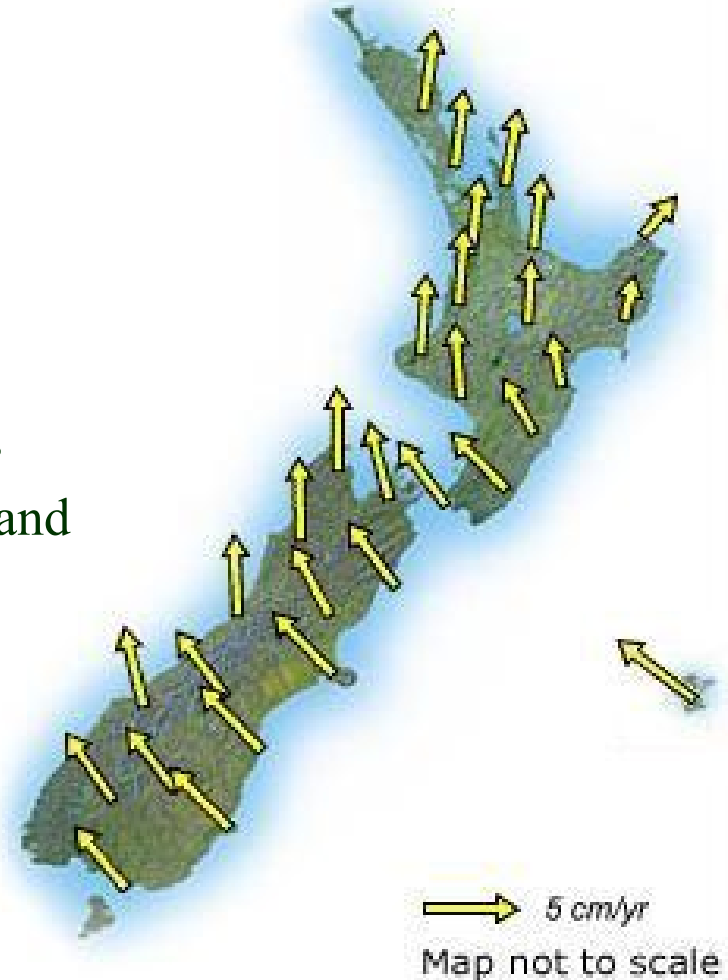


Land Information
New Zealand (LINZ)
established



Implementation of NZGD2000

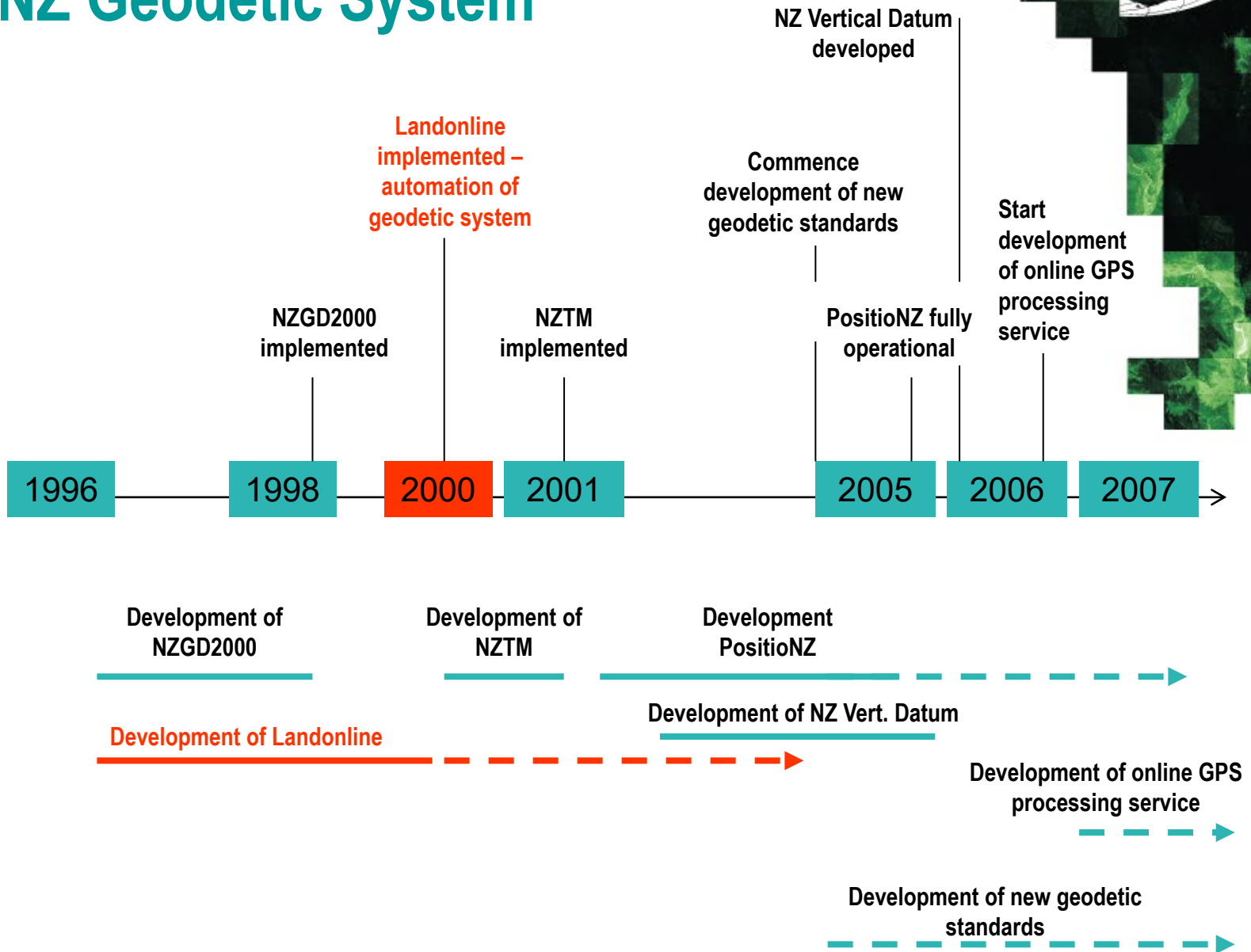
- **ITRF96** with epoch 2000.0 coordinates
- **Geocentric** origin
- **Semi-dynamic** datum
 - deformation model enables propagation of coordinates and observations



Major milestones in the development of the NZ Geodetic System



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Geodetic Implications of Landonline - 1



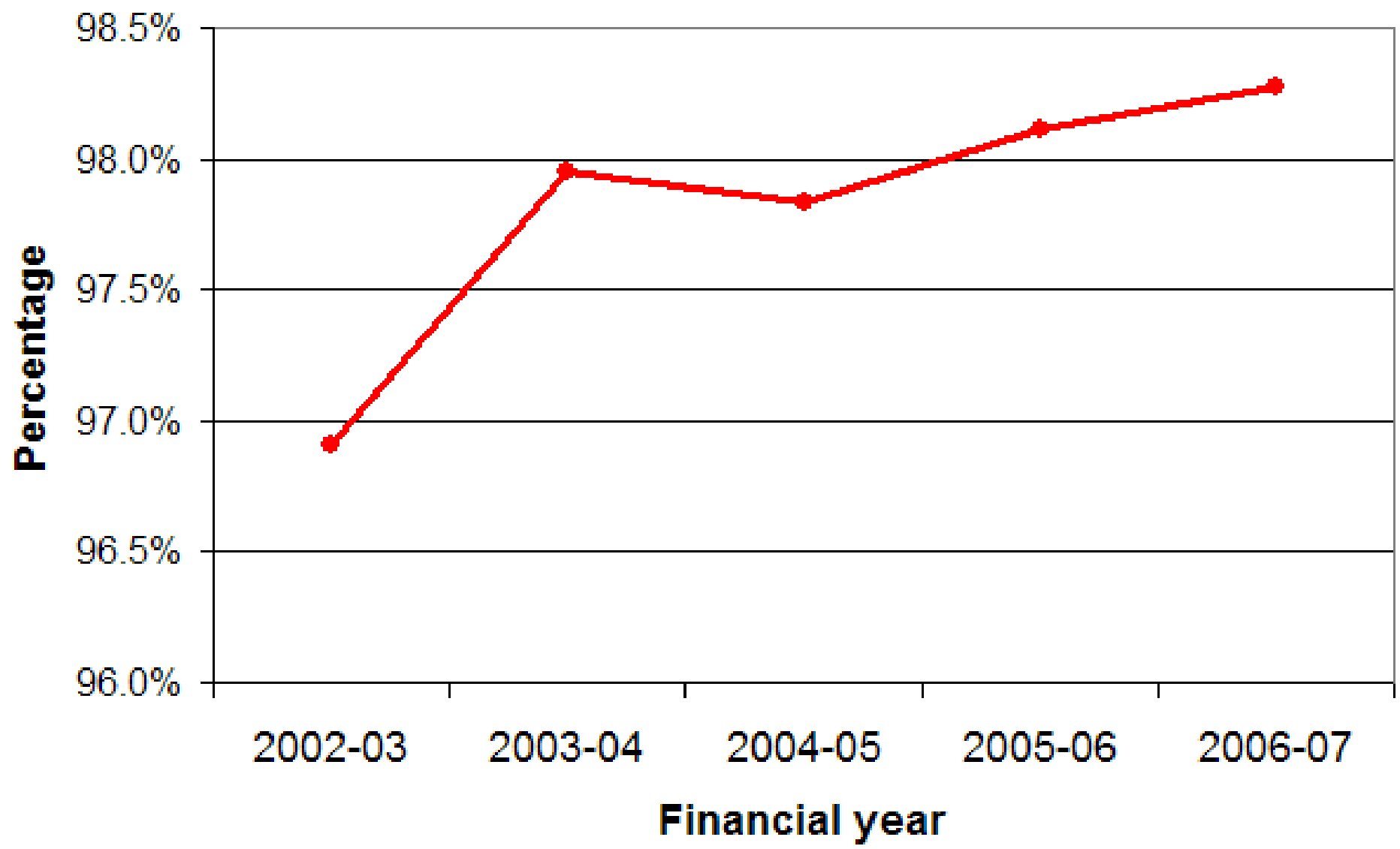
- Automation of **geodetic, cadastral, electoral** and **title** systems - conversion of more than 7 million physical records
- Development of **NZGD2000** a key component - all spatial data in Landonline held in terms of NZGD2000
- **100% e-delivery** of geodetic data from day 1
- All **new geodetic observations** and associated metadata are held in one database – Landonline – **observational database**

Geodetic Implications of Landonline - 2



- All **new and maintained site and mark details** are held in one database - Landonline
- Enables **readjustment of all data** – e.g. when defining a new datum or readjusting surveys
- Enables the **integration** of the geodetic and cadastral systems - the development of survey accurate cadastre
- **Third parties** use the **geodetic cadastre** to assist with managing other core spatial datasets

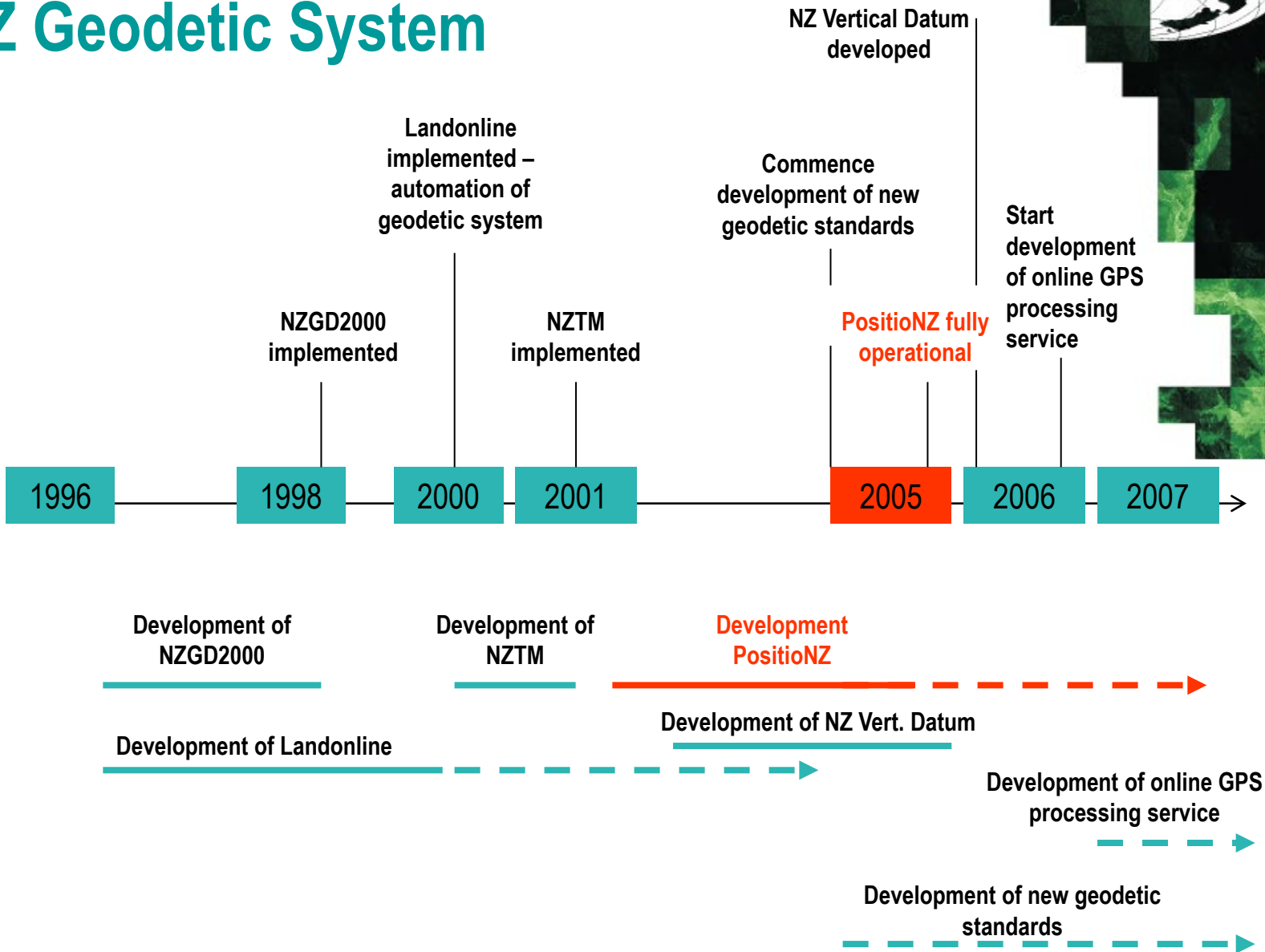
Cadastral Surveys on Geodetic Datum 2002-2007



Major milestones in the development of the NZ Geodetic System



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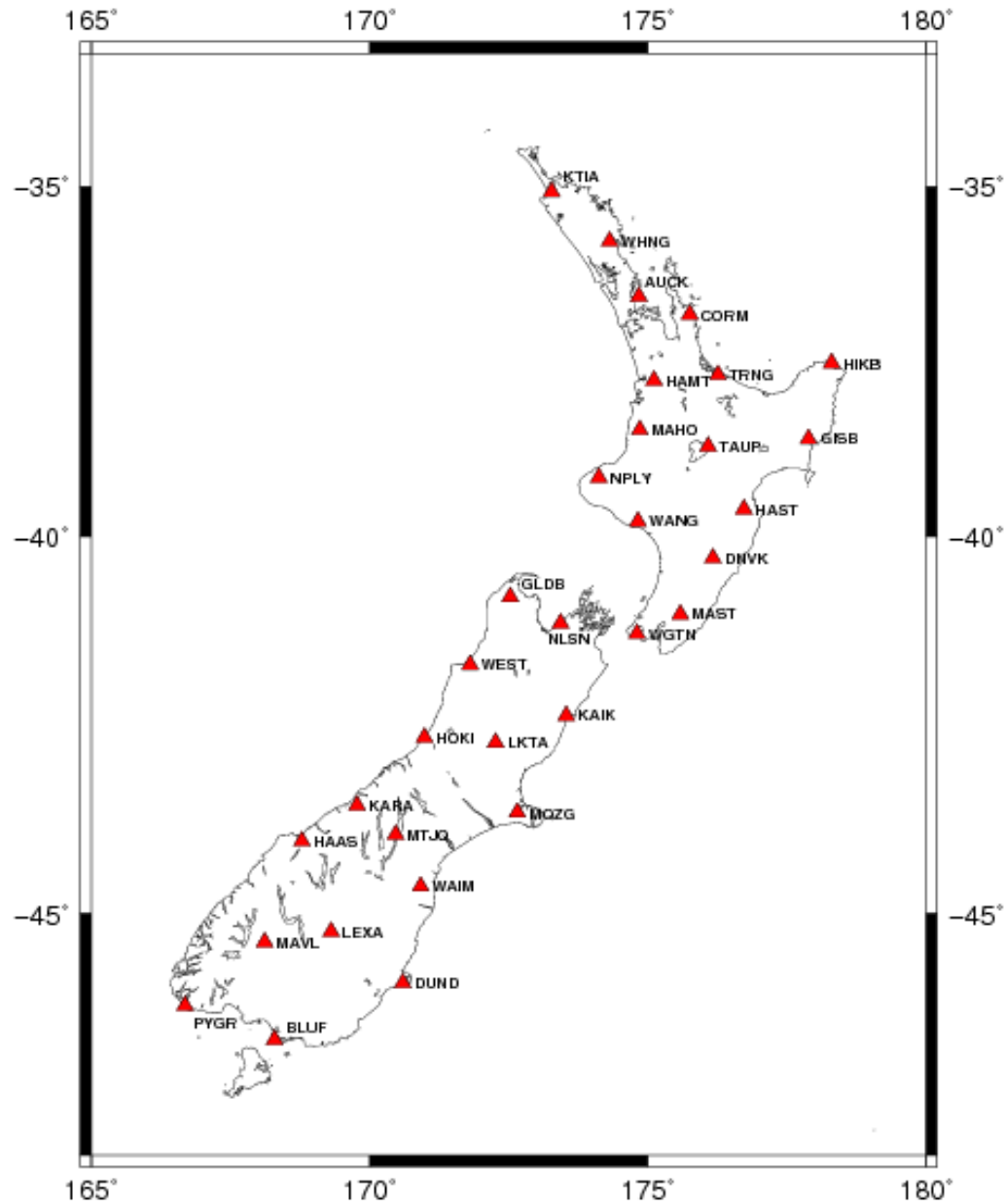
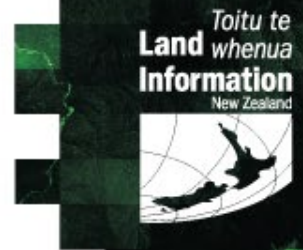
PositionNZ Network



- **32** CORS in New Zealand, **1** on Chatham Islands and **2** in Ross Sea Region of Antarctica
- 30 second **RINEX files** available
- Biggest users are **non-cadastral**



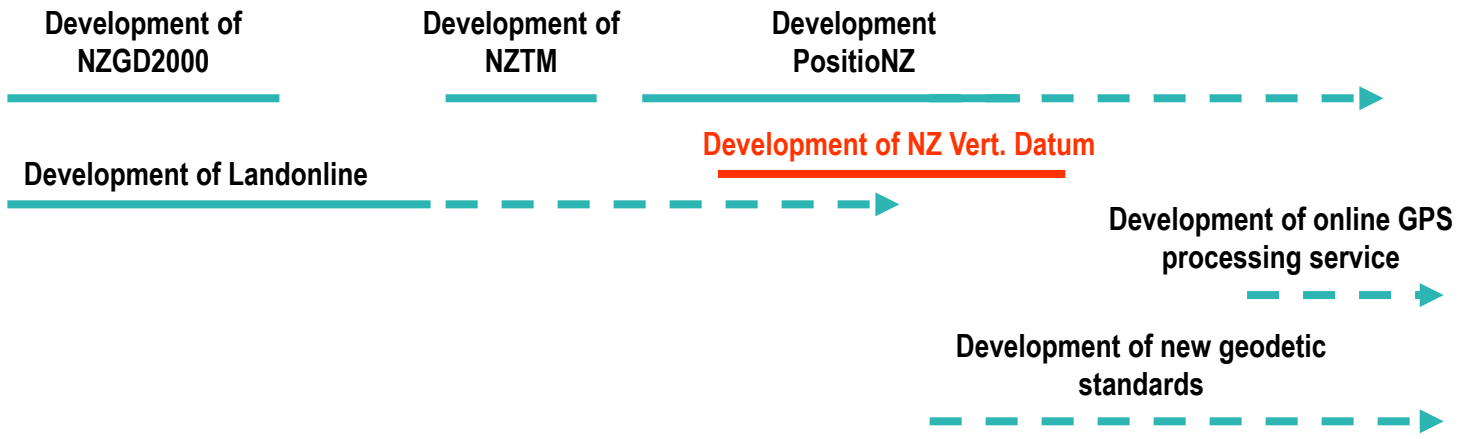
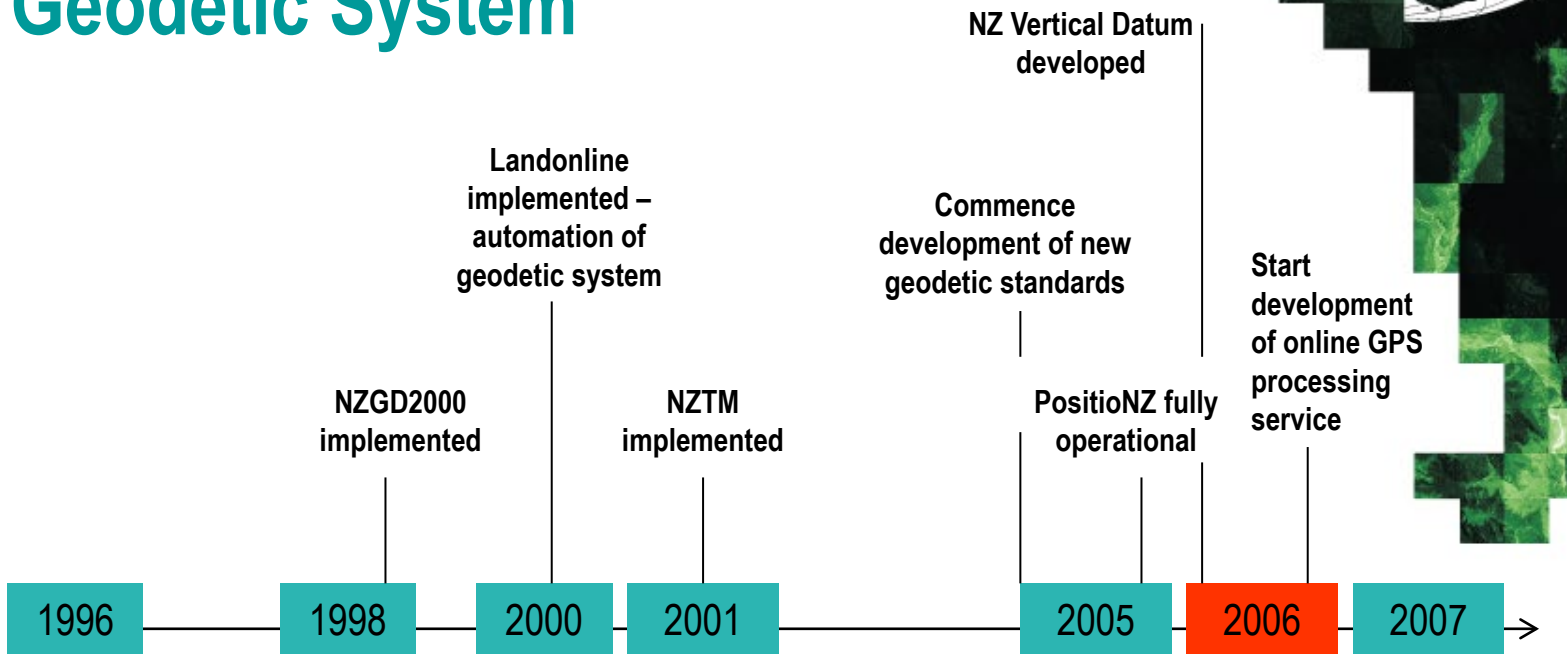
PositionNZ Network 2



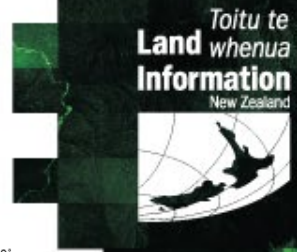
Major Milestones in the Development of the NZ Geodetic System



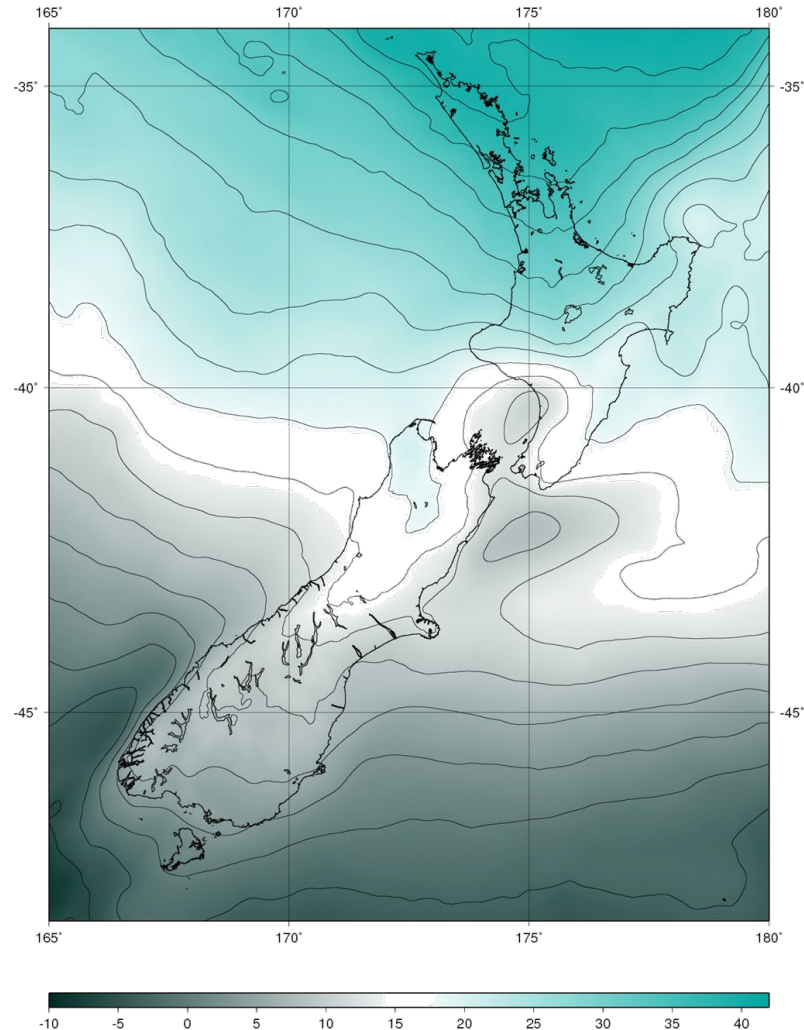
Land Information New Zealand (LINZ) established



NZGeoid05



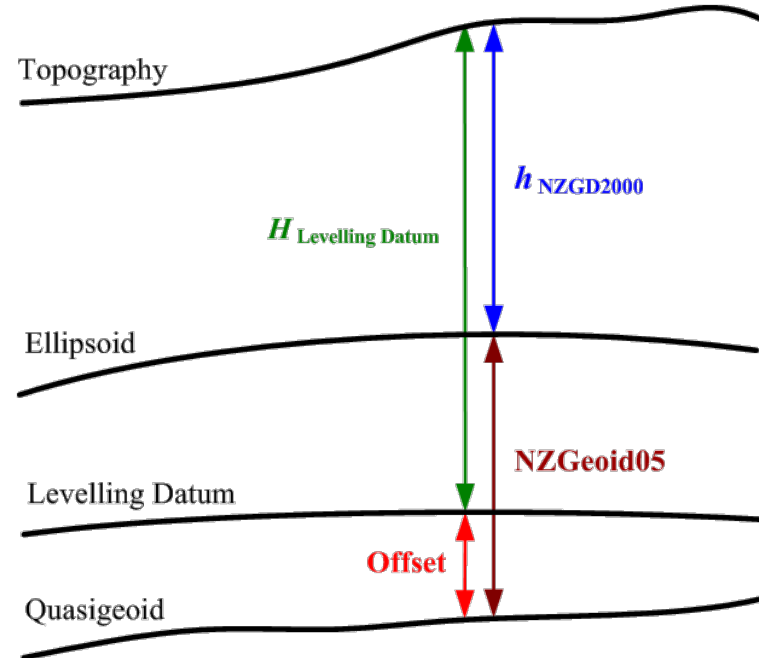
- **Gravimetric geoid**
using gravity observations to model the geoid
- Independent of levelling
- Significant **accuracy improvement** over other models



Height Transformations



- NZGD2000 uses **ellipsoidal heights** as the official heights
- NZGeoid05 plus datum offsets give **levelling datum heights**
- Transformations done online
- www.linz.govt.nz/nzvd



Future of the Geodetic System

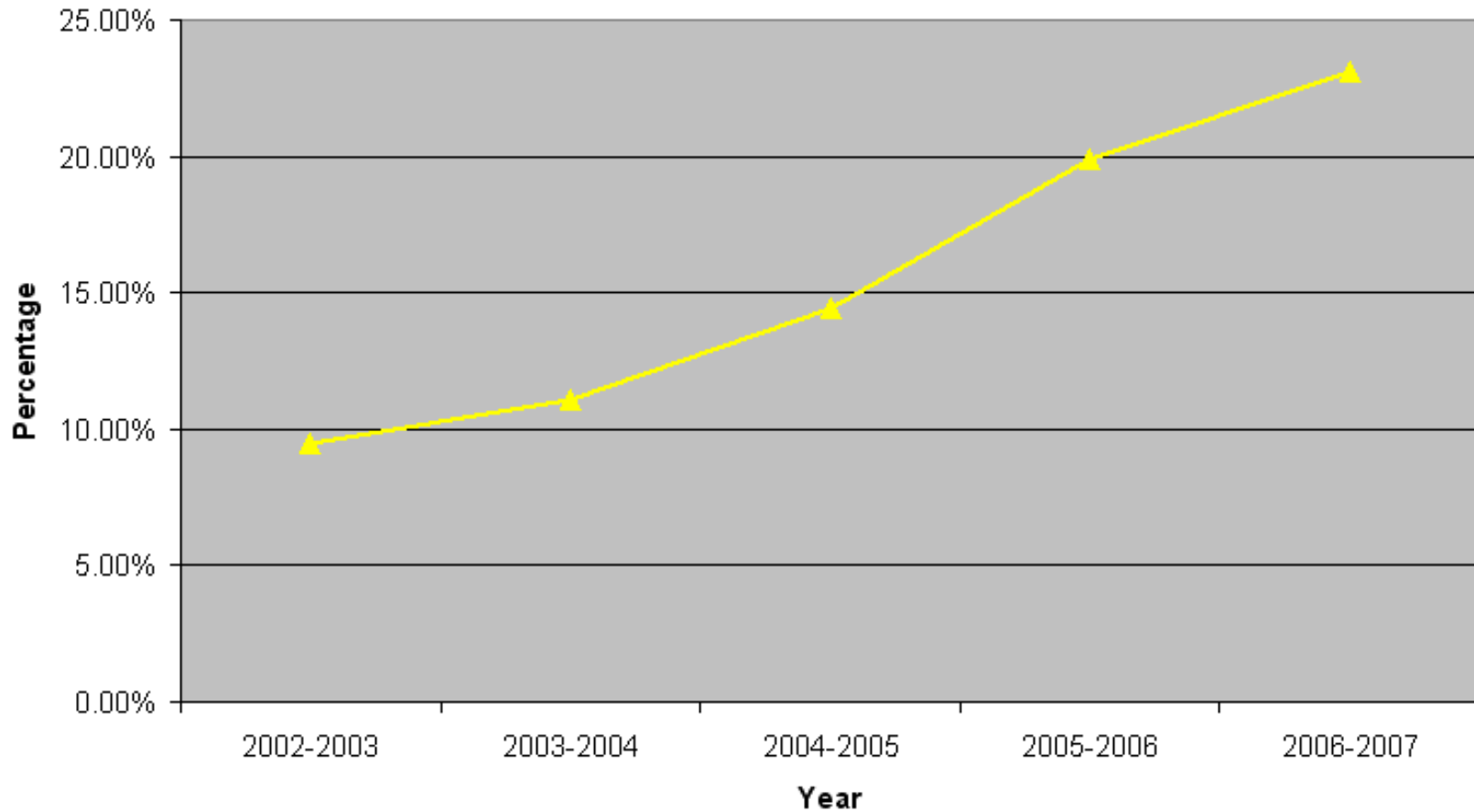
- Increasing demands from **non-expert users**
- **Uncertain** of their geodetic **requirements**
- Continued **development of PositioNZ** (incl 3rd parties) and delivery of **real-time services**
- Support **upgrade** of **cadastral** parcel fabric



PositionNZ Network Development 1



Percentage of Rural Cadastral Surveys Using GPS



PositionNZ Network Development 2



CODE: A3L8

Name: Trig O No 2 (Tarras S.D.)

Beacon after maintenance.

View towards Wanaka.

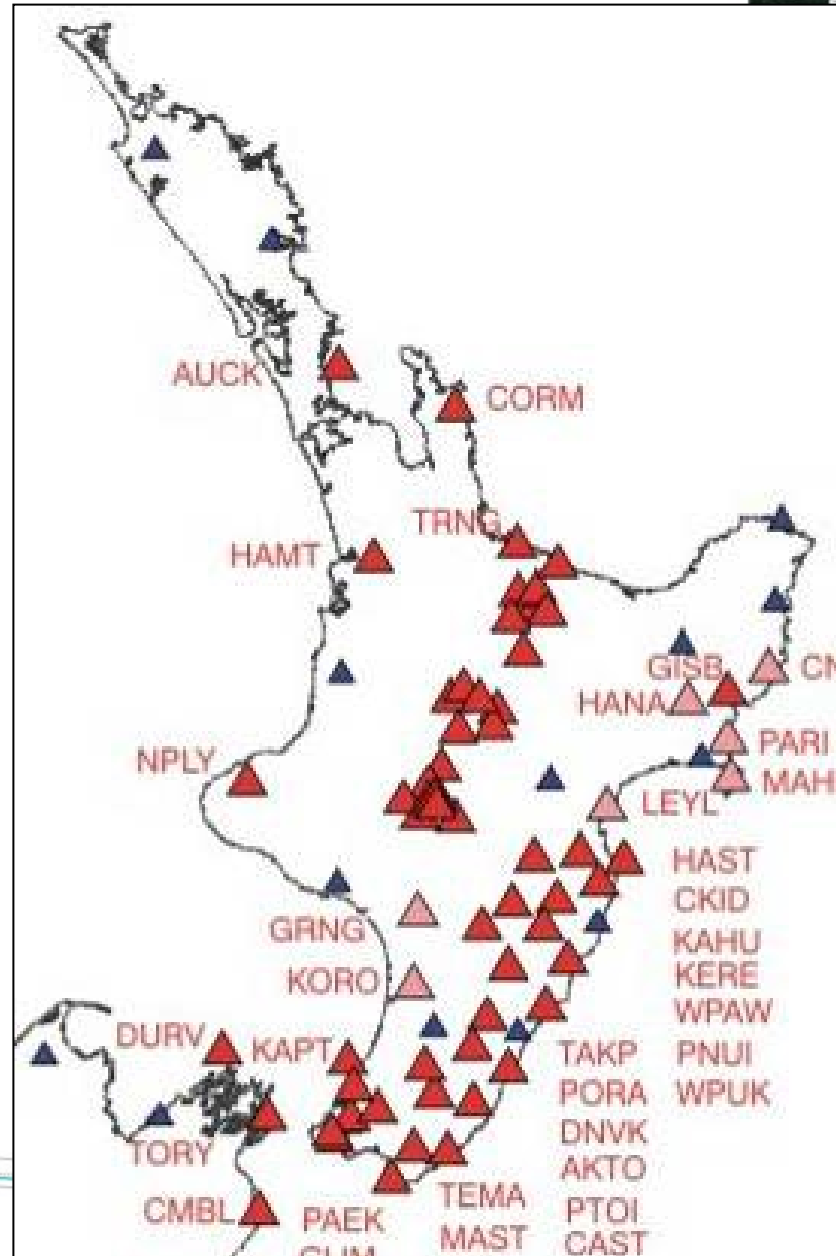
PositioNZ Network Development 3



PositionNZ Network Development 4



- Numerous stations currently capable of streaming **1 second data**
- Some areas with sufficient density to enable **Network RTK**
- **Communications** are the biggest challenge



Support Upgrade of Cadastral Fabric



- Cadastre **up to 50m out** in rural areas
- Strong interest from local authorities in having **accurate parcel data**
- Investigating **provision of geodetic control** to support accuracy improvements



Summary



- Sustainable resource management requires an accessible geodetic infrastructure
- A promising way to do this is through the provision of direct connection to NZGD2000 through a real time GPS service
- Widespread use of cadastral data as a base layer for resource management GIS. Inaccuracies in the cadastral data make management difficult



Questions?

I will be available for the rest of the day
at either the LINZ or FIG exhibitions