



A changing approach to geodetic networks and standards

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Overview



- Historical
 - Based on method of observation
- Current
 - Based on accuracy achieved
- Future

NZ Geodetic Datum 1949



Limitations of NZGD1949

- “New” technology
 - EDM, GPS, etc
- Public access to global datasets
- Earth Deformation
 - Earthquakes



Edgecumbe 1987 (M6.3)



Limitations of NZGD1949



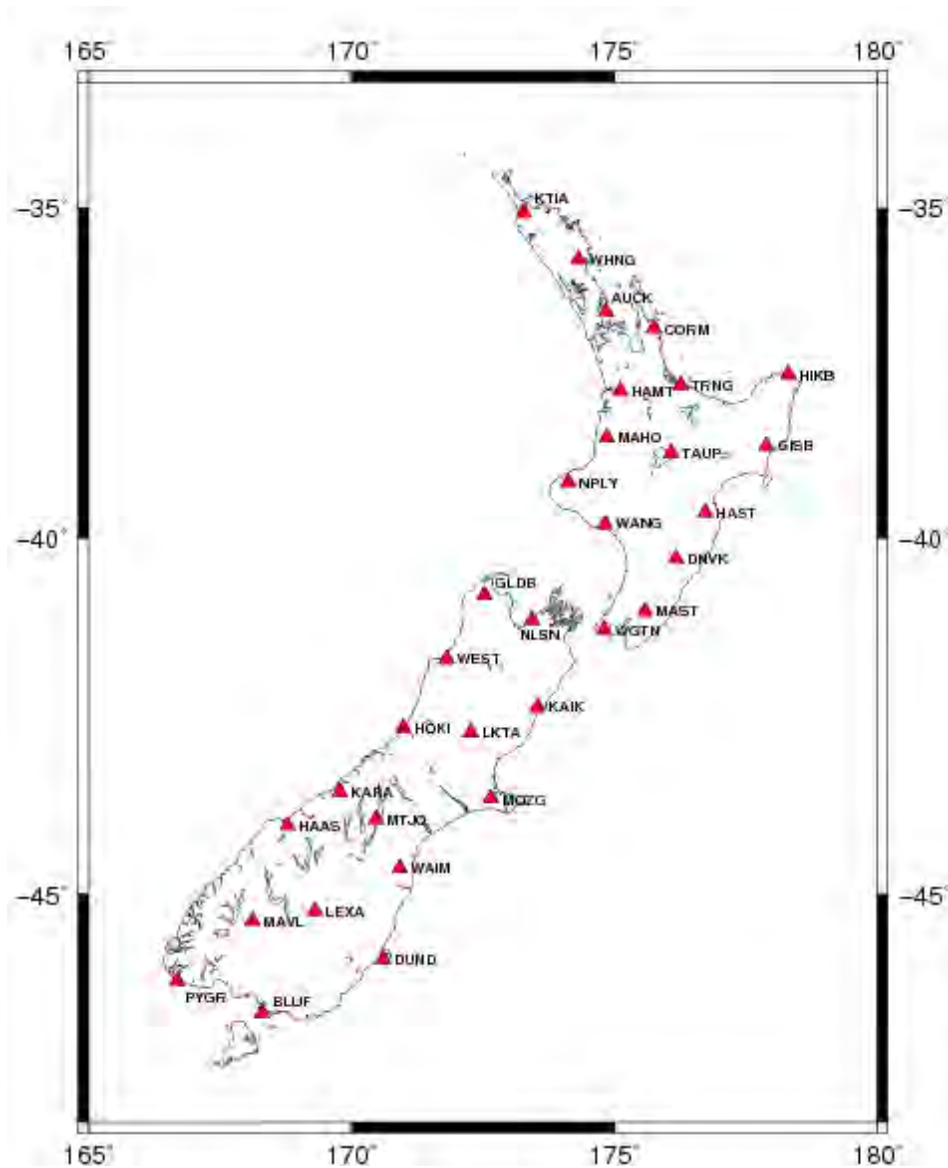
- “New” technology
 - EDM, GPS, etc
- Public access to global datasets
- Earth Deformation
 - 1855 Wellington earthquake – magnitude 8.2
 - 18m horizontal
 - 2.5m vertical
 - Continuous deformation
 - 5m / century between east and west of NZ
 - Motion relative to geo-centre of Earth

New Zealand Geodetic Datum 2000

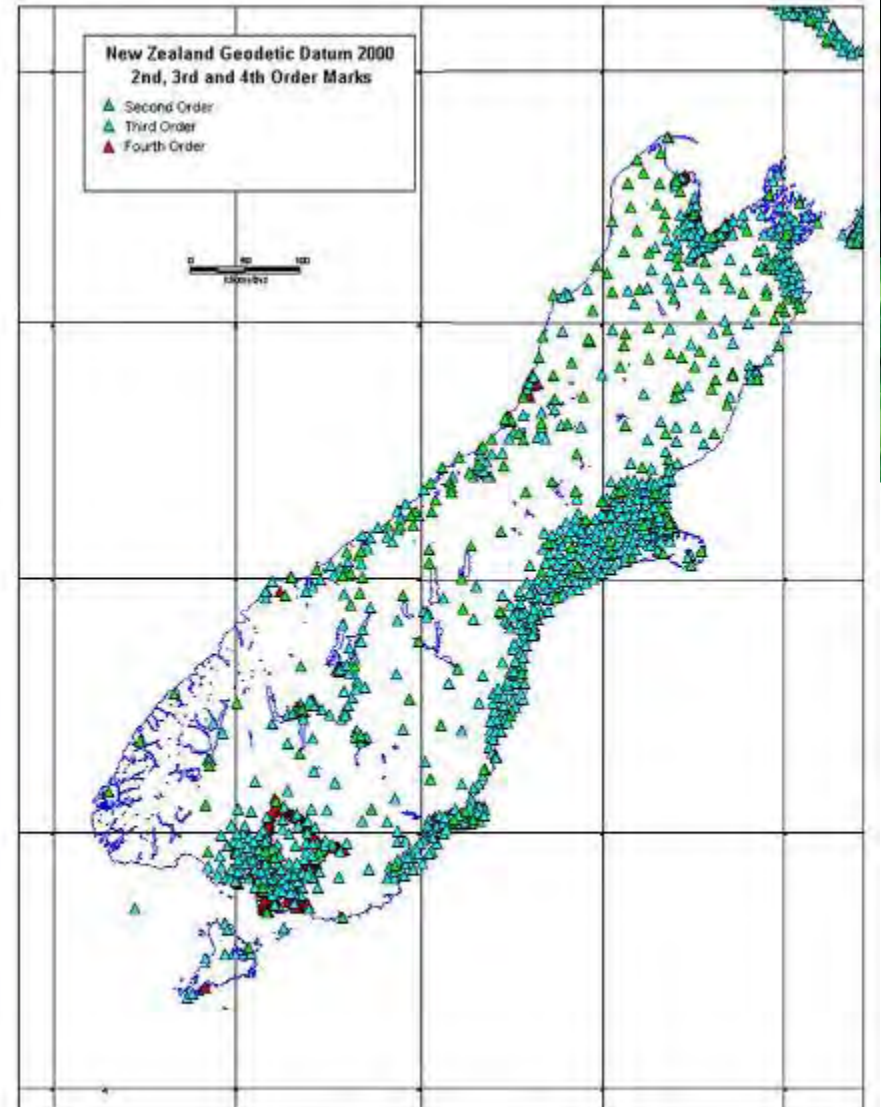
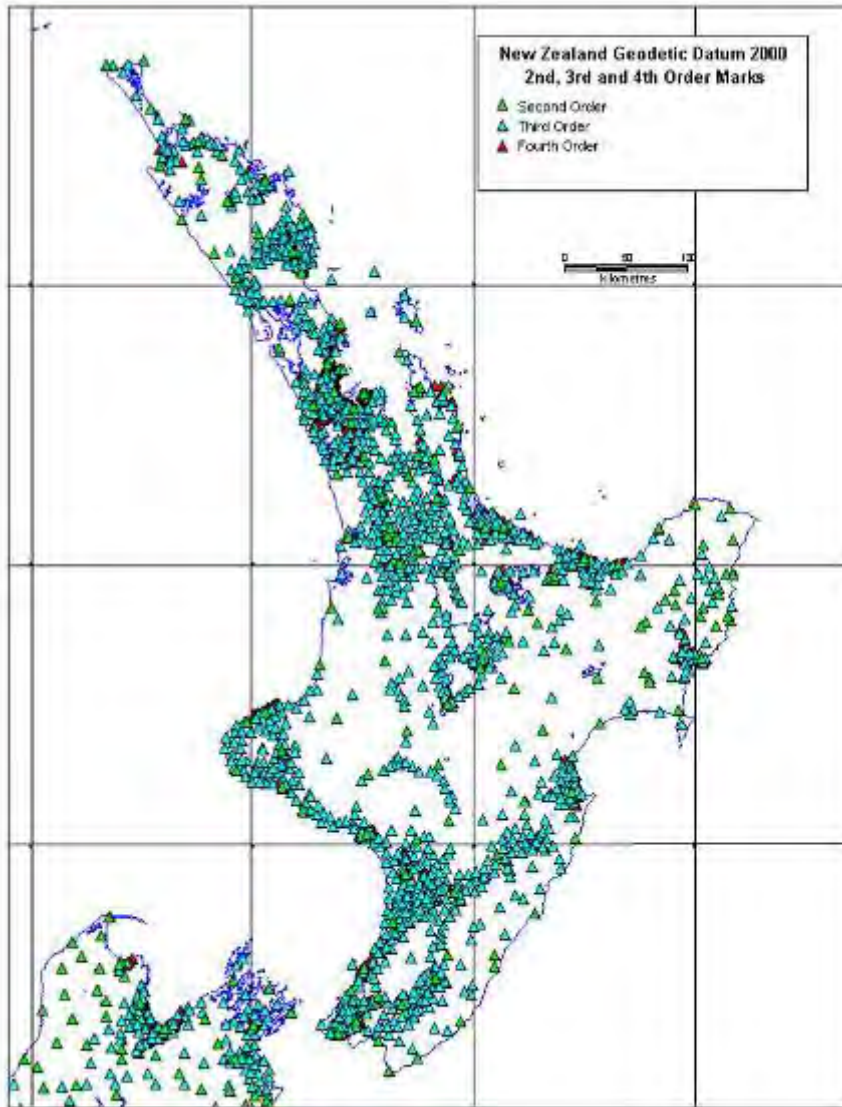


- GPS-based
- Geocentric
- Accommodates Earth deformation
- Monitored by continuous GNSS observations

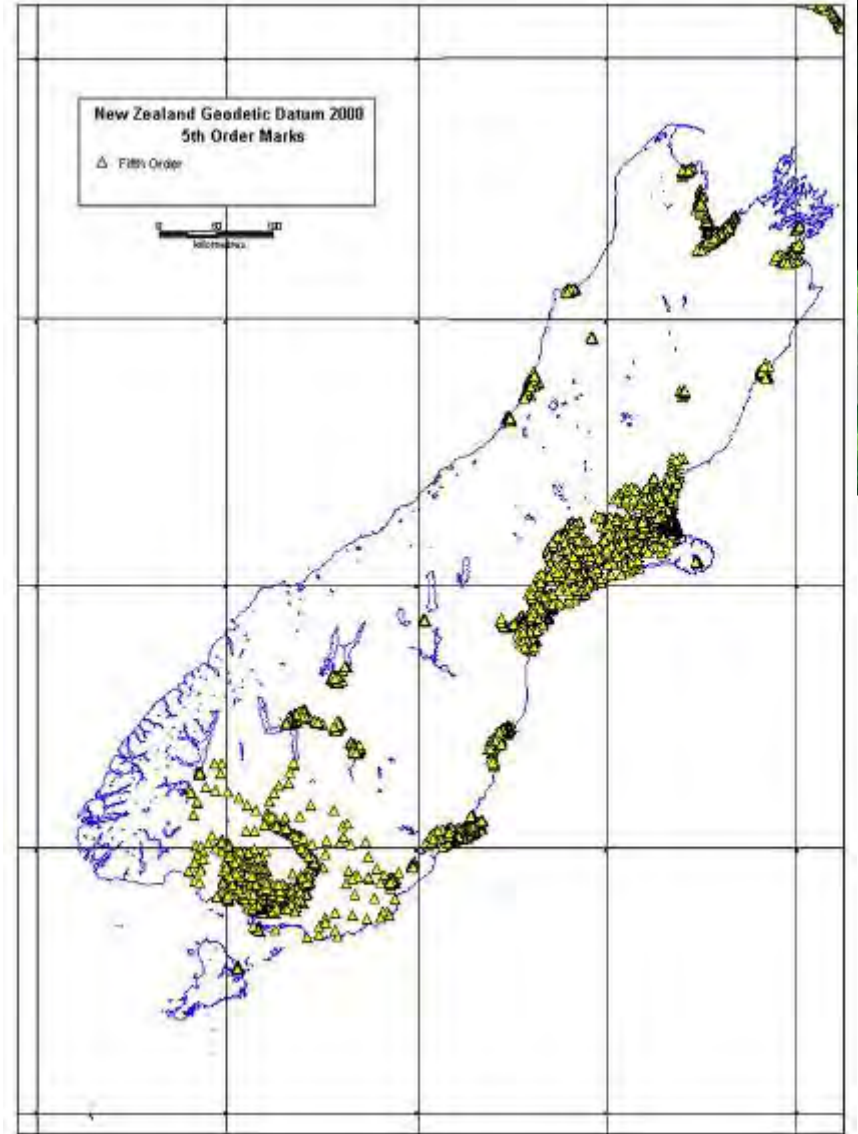
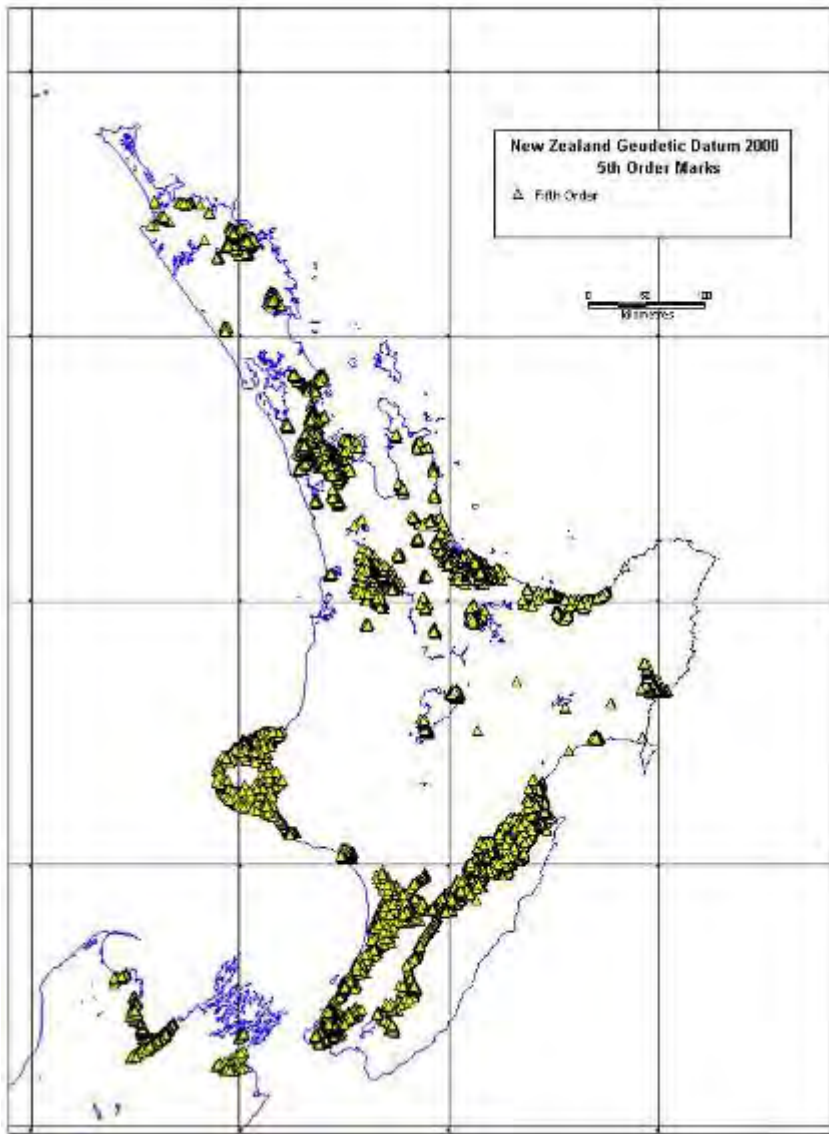
NZGD2000 Zero Order Network



NZGD2000 2nd – 4th Order Networks



NZGD2000 5th Order Network



Current network still not ideal

- Different and conflicting uses
- Different and conflicting characteristics
 - Density
 - Accuracy
 - Accessibility
 - Mark construction
 - Site stability
- Purposes not clear

What exactly do we need?



Proposed Future Geodetic Networks



- Networks defined by purpose (not by process)
- Accuracy of networks related to their purpose not how they are obtained
- Different mark characteristics for each network
- Marks can be in multiple networks

National Reference Frame



- Connection to the global frame
- One station for each tectonic plate
- Continuous GNSS observations
- Absolute gravity connection

Datum Monitoring Network



- Maintain accuracy of geodetic datum
- Monitor earth deformation
- Re-establish cadastre following major deformation events
- Density related to deformation rate
- Stability of marks important

Cadastral Control Network



- Geodetic marks to support cadastral surveys
- Enable connection to the geodetic datum
- Enable orientation to the geodetic datum
- Provided where cadastral surveys are being done
- Intervisibility important

Geospatial Network



- Alignment of geospatial datasets
- Datum connection in areas of little cadastral activity
 - Wilderness areas & National Parks
 - Offshore Islands
 - Ross Dependency
- Marks visible to “aerial” applications

Next steps



- Standard being drafted by LINZ Regulatory Group
- Review by expert committee early 2008
- Two month public consultation period
- Consideration of consultation feedback by committee
- Publication of standard late 2008
- Networks implemented by LINZ Customer Services

Summary



- Existing geodetic networks based on observation technique rather than function
- New geodetic networks based on purpose
- Different networks for different purposes
- Draft standard for consultation in early 2008
- Standard publication late 2008



End

