



Australian Government
Geoscience Australia

The Status of the National Geospatial Reference System and its contribution to Global Geodetic Initiatives

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Introduction

- **Australia's National Geospatial Reference System (NGRS)**
- **How has it changed**
- **Global Geodetic Observing System**
- **AUSCOPE**
- **Looking Forward**
- **Conclusion**

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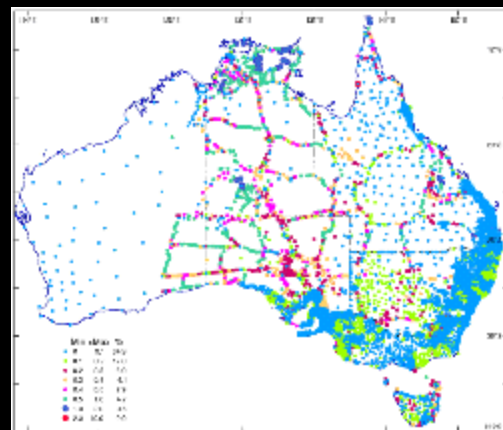
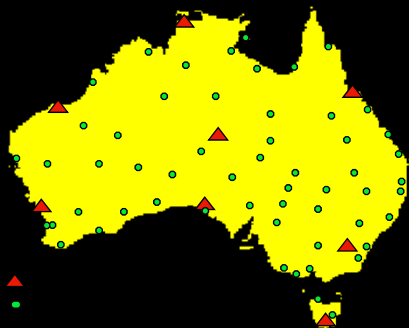
Australia's National Geospatial Reference System

- A coordinate framework that is accurate, reliable and accessible
- Direct linkage to an International Reference Frame that is accurate and stable
- Systems and tools to allow connection to the coordinate reference system and transformation of legacy data to the current reference system

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- GDA94 coordinates and uncertainties propagated down through the GPS and terrestrial networks



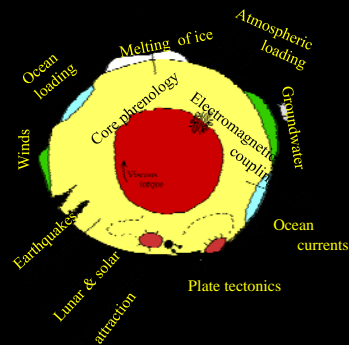
- ITRF92 @ 1994.0 positions determined for AFN and ANN and adopted as GDA94 Datum

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How has it changed

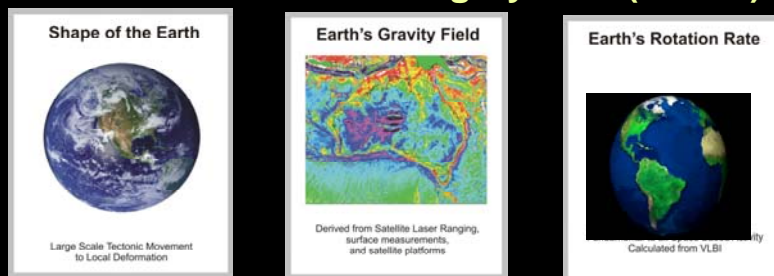
- Accuracies continue to improve generally by an order of magnitude every decade
- The number of users has grown
- Australia is a dynamic continent on a deforming planet
 - GDA94 is no longer serving the precision positioning applications



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Global Geodetic Observing System (GGOS)

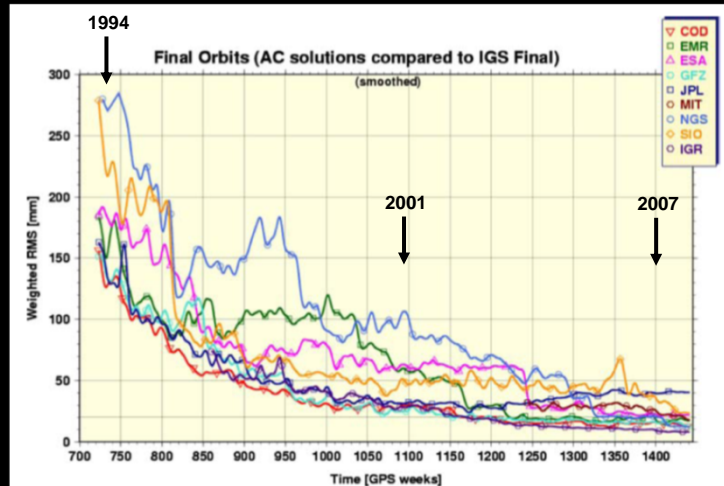


- Provides quantitative measurements of the dynamic nature of the Earth including
 - Plate tectonics / intraplate tectonics
 - Anthropogenic Subsidence
 - Earthquake induced crustal deformation
 - Sea Level Rise
 - Atmospheric Modelling

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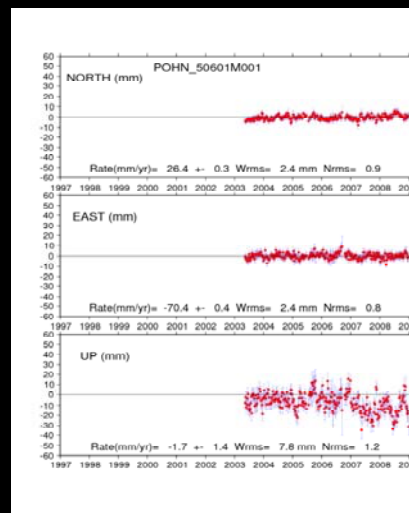
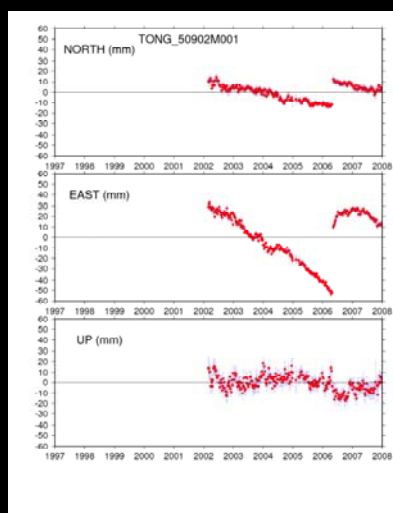
What are the attributes of a dynamic system that we want



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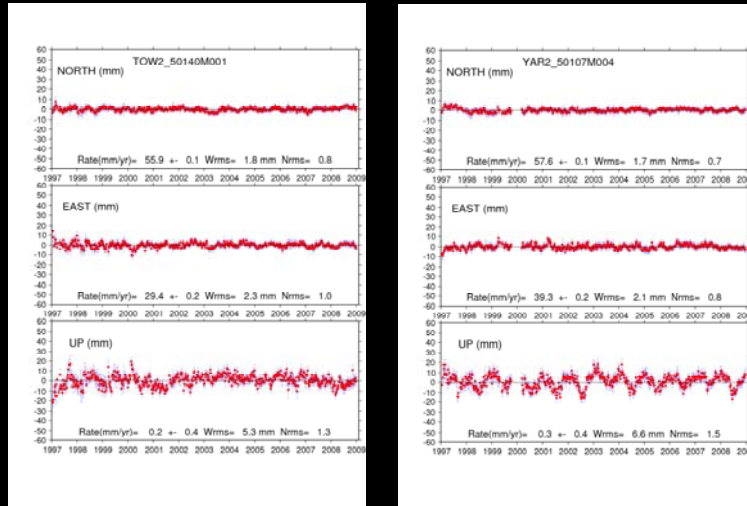
Time series steps



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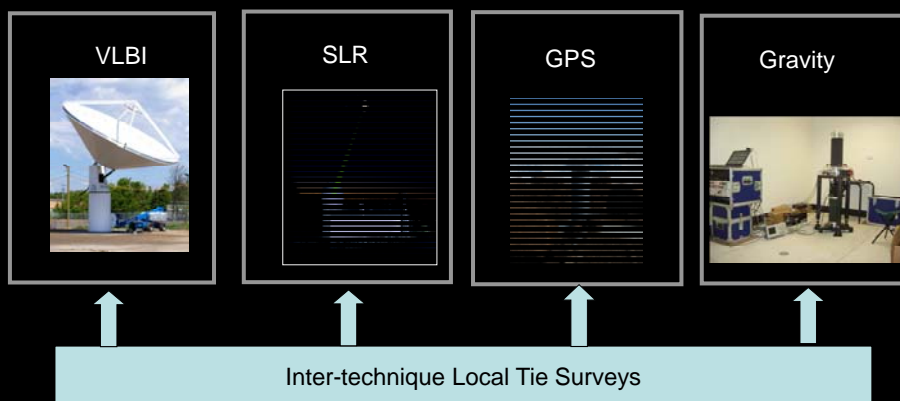
Time series signals



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Australia's role in defining the ITRF – contributing to GGOS



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AuScope Geospatial Infrastructure Program

- 3 new 12m VLBI telescopes;
- A VLBI observation correlation facility;
- 4 new Gravity instruments (1 Microg FG5 absolute gravimeter plus 3 gPhone Earth Tide Metres) and observation program around a national network;
- A Laser power upgrade at the Mt Stromlo Satellite Laser Ranging observatory;
- 100 new GNSS sites

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AuScope GNSS Network with VLBI and SLR sites



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Looking Forward

- Need to incorporate desirable attributes of ITRF into a national datum
 - Continually refined
 - Observes Earth dynamics
- Need to remove national boundaries
- Need to develop systems for transforming / adjusting legacy data sets to the current coordinate frame (where required)
- Dynamic datum offers these options

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Summary

- GDA94 has served us well but is showing its age
- GGOS and the IAG services have developed systems, data and methodologies for dealing with a dynamic Earth
- AuScope is giving us the tools to follow the GGOS lead
- A dynamic datum will keep Australia's positioning applications accurate and current, and therefore internationally competitive

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