The GeoNet and PositioNZ multi-GNSS networks (New Zealand): future challenges from an IGS network operator point of view

E.D’Anastasio, P. Gentle, M. Amos, D. Campbell, L. Bland, K. Fenaughty

1 GNS Science – Te Pu Ao, 2 Land Information New Zealand

THE NETWORK

The GeoNet and PositioNZ networks, operated by GNS Science in partnership with Land Information New Zealand (LINZ), comprise the New Zealand national continuous GNSS network. The networks contain approximately 100 CORS sites, including 3 stations located outside of New Zealand (Antarctica, Tonga and Samoa). The LINZ PositioNZ network is a subset of 37 stations contained within the GeoNet network.

GNS Science and LINZ contribute 7 sites to the IGS network, 6 of which are part of the IGS-Real Time network.

THE INFRASTRUCTURE

The GeoNet/PositioNZ data is used by a wide community, the majority of which is made up of surveyors and researchers.

Data processing and quality: daily solutions calculated with scientific processing software (Bernese, Gipsy, Gamit) are still mainly focused on GPS processing only.

Other aspects to consider:

- Increased data volume: with full constellation enabled, streamed data volume is twice as large, and could be an issue for some data links (VSAT, cellular) requiring further upgrades.
- Transition period: there will be a transition period to move the whole structure from GPS+Glonass (Rinex2 and RTCM3.x) to full-GNSS (Rinex3 and RTCM-MSM), and for end users to accommodate that. How long will it last?
- Data format and handling: our data translation and quality check are heavily reliant on teqc. Teqc does not support the new Rinex3 file format. A tool which is powerful, recommended by IGS and supervised by a wide scientific community is desirable.

THE CHALLENGE

The increasing number of available constellations encourages the move to multi-GNSS signal tracking. Currently, 63% of the GeoNet/PositioNZ sites are tracking GPS and Glonass and 5 PositioNZ sites are tracking also Galileo, QZSS and BeiDou, contributing to various multi-GNSS projects such as MGEX.

Redundancy is a key component of our network infrastructure. Streaming sites has a primary and backup data link, and servers are located and duplicated in 2 different sites in New Zealand.

Streamed daily data are made freely available through our websites.