2018 New Zealand SC-AGI\(^1\) Report

Submitted by New Zealand to SCAR’s Standing Committee on Antarctic Geographic Information

Davos, Switzerland

Monday 18 June 2018

\(^1\) SC-AGI - Standing Committee on Antarctic Geographic Information
1 New Zealand SC-AGI Members

Graeme Blick  Chief Geodesist and Group Manager Positioning & Resilience
Wendy Shaw  Secretary, NZ Geographic Board
Mark Dyer  Surveyor-General and NZ Geographic Board Chairperson

2 LINZ² Geodetic Activities

LINZ has continued with its geodetic activities in the Ross Sea Region of Antarctica undertaking the following activities:

- Continuing support of the POLNET project, by operating GNSS CORS stations at Cape Roberts and Scott Base, and support to the Butchers Ridge site. LINZ is in discussions with the US to take over operation of 2 further POLNET sites at Butchers Ridge and Minna Bluff.
- Maintenance, calibration and operation of tide gauges at Cape Roberts and Scott Base.

- Deformation surveys of:
  - Hillary’s TAE Hut at Scott Base; and
  - Scott’s Discovery Hut at Hut Point

- Monitoring surveys of the wind turbines at Crater Hill which supply electricity to Scott Base and McMurdo Station.

² LINZ: Land Information New Zealand
3 LINZ Hydrographic Charting

LINZ is extending its hydrographic activities in Antarctica by:

- Reviewing and incorporating into existing charting of the Ross Sea Region bathymetric data from scientific voyages in the Ross Sea provided by GNS Science.
- Investigating ships that may provide an opportunity to acquire bathymetric data collected during scientific or tourist voyages to the Ross Sea.
- Including Antarctic charting and hydrographic surveys in future LINZ national hydrographic survey and charting programmes.

4 LINZ Topographic Mapping

Following the NZGB corrections, improvements, validation, and newly assigned names, these updates will be applied to the current LINZ Antarctic topographic map database during 2019.

A new Antarctic base map is under development by LINZ. When in production, the base maps will be added to the LINZ Tile Services: http://tiles.maps.linz.io/

The base map uses publicly available data, including bathymetry, from sources such as the Antarctic Digital Database and Quantarctica. Tiles in EPSG 3031 (Antarctic Polar Stereographic) and 5482 (Ross Sea Region Polar Stereographic) are currently planned.
5 ANC³ / NZGB⁴ Antarctic administrative actions

These actions resulted from the ANC meeting on 1 March 2018 and the NZGB agreed to them at its meeting on 12 April 2018:

- Update the Strategic Action Plan to include maintaining, improving, and formalising the NZGB's intergovernmental relationships in the Antarctic as a high priority.
- Resume talks on establishing joint naming protocols or Memorandums of Understanding with other countries.
- Proactively engage with other nations establishing operational bases within New Zealand’s area of interest, to promote naming protocols.
- Update the Frameworks document⁵ for ‘Antarctic Names’ in respect to geographic names in a foreign language to be Romanised, and case by case where generic terms may be translated to English or added to a name for identification and safety.
- Produce an A5 flyer about Antarctic naming processes, for distribution to Antarctica New Zealand, on the RV Tangaroa, to universities, at events and conferences, etc.
- Review the material on Antarctic geographic naming currently provided by Antarctica New Zealand in its handbook that it distributes to those outbound to Antarctica, and suggest any corrections and improvements as required for geographic naming.
- Amendments to the Antarctic name proposal form and proposal notes to more accurately account for processes under the NZGB Act 2008.
- The ANC affirmed support for the NZGB to seek amendments to the NZGB Act 2008 to remove ambiguities and errors, eg around Discontinuing Antarctic Names.

6 ANC / NZGB Antarctic naming

The NZGB Chairperson made 402 Antarctic geographic name decisions, under delegation, on 20 March 2018. The categories were:

- Altering existing and assigning new names (96)
- Correcting mistakes in past Gazettes (39)
- Validating past approved names (262)
- Declining a name (1)
- Amending the Gazetteer (4)

On 24 May 2018 the decisions other than the declined name and amendments were notified in the NZ Gazette.

These decisions nearly conclude investigations since 2015 to:
- identify names that NZ had previously approved, which were missing from the New Zealand Gazetteer,
- to correct specific errors (in the names, feature types, and coordinates),
- to rationalise differences to the Australian, United States, and SCAR Gazetteers.

The ANC noted the remaining differences between the USGS-GNIS⁶, Australian Antarctic, and New Zealand Gazetteers (212 names) within New Zealand's area of interest for further investigation and consultation. The ANC also identified the 196 existing German and Italian names in Northern Victoria Land to consider confirming and assigning in the New Zealand Gazetteer. New Zealand will contact Germany (via Ständiger Ausschuss für Geographische Namen) and Italy (via Comitato per i nomi geografici antartici) for details on the names.

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³ ANC: Antarctic Names Committee
⁴ NZGB: New Zealand Geographic Board Ngā Pou Taunaha o Aotearoa, NZ’s national place naming authority.
⁵ The Frameworks outlines the policies, principles, guidelines, and practices of the NZGB.
⁶ Geographic Names Information System
Under its standard process, on 24 May 2018 the ANC also:
- with agreement from US-ACAN and consent from the AADPNC\(^7\), assigned a new name **Shiraishi Peak**, in the Meteorsite Hills, for Dr Kazuyuki Shiraishi – Geologist, Meteoriticist, Director-General of NIPR and prior chairperson of COMNAP\(^8\).
- with agreement from US-ACAN, assigned a new name **Harrowfield Hill**, at Inexpressible Island, for Dr David Harrowfield – New Zealand conservator of Antarctic historic sites and artefacts, and celebrated Antarctic historian and author.

Four new Antarctic geographic name proposals from US-ACAN for subglacial lakes were considered by the ANC in May 2018. They are located on Gould Coast on the east of the Ross Ice Shelf, within the system of ice streams and ice ridges that drain part of the West Antarctic Ice Sheet into the Ross Ice Shelf. Once approved by US-ACAN the NZGB will gazette them as official and include them in the NZGB Gazetteer.

### 7 NZGB coordinate improvements

#### Progress

The NZGB has reviewed and confirmed or improved coordinates for approximately 35%\(^9\) of its Antarctic names since the 2017 ANC meeting. It is likely that the coordinates of many names validated in 2009 and 2012, or assigned from 2000-2015 remain fit for purpose, but they have yet to be reviewed. Under the NZGB Act 2008 the ‘Validation’ process confirmed existing Antarctic names and covers the majority of Antarctic names in the Gazetteer. However, the coordinates date back to the 1958 *Provisional Gazetteer of the Ross Dependency* in some instances - New Zealand’s first official Antarctic Gazetteer.

The 2012 validation gazette contained 300 names that adopted new coordinates produced in 2012 by LINZ\(^10\) Topographic for its 1:50k topographic maps. A further 450 names could adopt the AntTopo50 coordinates. However, while the coordinates are highly accurate to the features depicted, a review is required to check that the names were applied to the correct features as originally named.

Assessing and improving coordinates for the balance of Antarctic geographic names may be time consuming. The remainder of the names fall within areas of old topographic mapping (1960s-1980s) at 1:250k scale by NZ and the USA, or in areas where there is no topographic mapping. As time and resources allow, these Antarctic geographic names could be addressed in batches by map sheet or decision year.

#### New resources

Since October 2016 the NZGB has made extensive use of highly accurate and detailed NSF\(^11\) satellite imagery to improve coordinates. The Polar Geospatial Center (PGC) made the imagery available to assist the SC-AGI initiative to improve Antarctic Gazetteer information.

The imagery is accurately geo-referenced, but this also means it is 'flat' - without further context it can be difficult to identify some features and interpret, eg to determine a coordinate on a peak. The NZGB has used the USA’s TMA\(^12\) photographic archive of oblique aerial photography (also hosted by PGC) to aid interpretation of the satellite imagery, but it is time consuming to download and match to the satellite imagery.

PGC advised that in 2018 it expects to release the first edition of its new Antarctic DEM (Digital Elevation Model) ‘REMA\(^13\)’. This detailed elevation data with ‘a posting of 8m and accuracy better than 1m’ is significantly better than any existing DEM. The Arctic equivalent ArcticDEM

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\(^7\) Australian Antarctic Division Place Names Committee  
\(^8\) Council of Managers of National Antarctic Programs  
\(^9\) This figure is c.1280 names considered in March 2017 and March 2018, plus all other replaced, withdrawn, and discontinued names, and the small number of other standard process names since 2015.  
\(^10\) LINZ: Land Information New Zealand  
\(^11\) NSF: National Science Foundation  
\(^12\) Trimetrogon aerial  
\(^13\) Reference Elevation Model of Antarctica
with ‘postings between 2-5m’ was released in 2016 and can be viewed via the PGC website. Once REMA is available it should be much easier to identify and interpret elevation to help determine new coordinates for geographic features. Currently the NZGB requests elevation from PGC on an ad hoc basis.

8 SCAR CGA rationalisation

Progress and SCAR-CGA updates

The work on Antarctic names 2016-2018 was initially motivated by an attempt to rationalise significant differences between the New Zealand Gazetteer and SCAR-CGA. The attempt highlighted the extensive number of errors in the New Zealand Gazetteer, which are now resolved.

As at 1 March 2018 SCAR-CGA had recorded 2597 of New Zealand’s Antarctic names, compared to 4415 recorded in the New Zealand Gazetteer. Of those 4415, 4172 are official names and should be recorded in SCAR – a difference of 1575. Following delegated decisions from the 1 March 2018 ANC meeting this difference has increased. Many updates to New Zealand’s Antarctic geographic names already recorded in SCAR-CGA are required, eg, to remove non-existent names and duplicates.

The NZGB has completed a comparison between the New Zealand Gazetteer and SCAR-CGA to correct existing, and add new, SCAR feature ID numbers in preparation for renewing the rationalisation project.

In November 2017 the SCAR-CGA released new standardised forms for updating existing entries and submitting new entries in bulk. While this should make the SCAR-CGA rationalisation work easier, the forms are still spreadsheets, and Italy or Australia will still be manually verifying applications.

SCAR-CGA has updated the desired format of entries to separate the ‘Narrative’ (history/origin/meaning) and the ‘Description’ (physical location and appearance of the feature). This update would bring the SCAR-CGA in line with the New Zealand Gazetteer’s format for names elsewhere in New Zealand. However, New Zealand’s Antarctic geographic names had strictly adhered to the former SCAR-CGA format. All entries in both SCAR-CGA and the New Zealand Gazetteer potentially need to be updated to separate the information.

9 SC-AGI meeting, August 2017

In conjunction with the UNGEGN conference at the UN, New York, a meeting of SCAGI was held on 16-17 August 2017, attended by the NZGB Chairperson and NZGB Secretary.

10 New Zealand Annual Science Conference, 26-28 June 2017, Otago Museum, Dunedin

A poster (Appendix A) was submitted on behalf of the NZGB. The poster detailed the progress of coordinate improvements and corrections to Antarctic names, and the role of New Zealand geographic naming in Antarctica. A digital can be provided to SC-AGI members on request.
11 NZGB Gazetteer: [https://gazetteer.linz.govt.nz/](https://gazetteer.linz.govt.nz/)

The new Gazetteer was launched in April 2018 replacing the June 2013 version. The improvements focussed on the user experience, extending coverage to include all of the NZGB’s naming jurisdiction and providing more detailed spatial context. Moving to the Leaflet™ platform provided flexibility to continue updating and refreshing the Gazetteer as technology changes.

The updated Gazetteer uses the full suite of LINZ mapping products (including LINZ Antarctic Topographic maps) and a NZ Colour basemap incorporating NIWA\(^{14}\)'s bathymetric data – users can now find out about named undersea features to the edge New Zealand’s continental shelf and geographic names in Antarctica in their spatial context.

The next significant update to the New Zealand Gazetteer will be to include the new Antarctic Basemap under section 5 above, pending its completion.

12 UN Sustainable Development Goals

A brief NZGB paper (Appendix B) will be published in the next edition of UNGEGN’s bulletin #54.

\(^{14}\) National Institute of Water and Atmospheric Science
Improving Feature Coordinates for Place Names in the Ross Sea Region

The Context:

In the recent past, many administrative and nautical charts have been produced using the LinZone concept, which has led to the creation of a large number of feature names that are often ambiguous or misleading. This has resulted in confusion and errors in navigational and administrative applications. The LinZone Reference: A3261613 has been developed to address these issues by providing a comprehensive solution for improving the accuracy and precision of feature coordinates.

What is the New Zealand Government doing?

The New Zealand Government has initiated several projects to improve the accuracy of feature coordinates in the Ross Sea Region. These projects involve the collection and analysis of data from multiple sources, including satellite imagery, aerial photography, and ground surveys. The data is then used to create high-resolution maps and charts that accurately represent the feature locations.

What is the process?

The process involves the following steps:

1. Data Collection: Data is collected from various sources, including satellite imagery, aerial photography, and ground surveys.
2. Data Analysis: The data is analyzed to identify errors and inconsistencies in feature coordinates.
3. Data Correction: The identified errors are corrected to improve the accuracy of feature coordinates.
4. Data Verification: The corrected data is verified to ensure its accuracy and reliability.
5. Data Distribution: The corrected data is distributed to relevant authorities and stakeholders.

Who have access to the data?

Access to the data is restricted to authorized personnel and stakeholders who require it for their respective tasks. The data is stored in a secure database to prevent unauthorized access.

Where are we now?

The project is currently in the data collection phase. The team is working on collecting data from various sources, including satellite imagery and aerial photography. The data analysis phase is expected to begin shortly, and the data correction phase will follow.

What’s next?

The next steps include the verification phase, where the corrected data will be verified to ensure its accuracy and reliability. After verification, the data will be distributed to relevant authorities and stakeholders.

LinZone Reference: A3261613
Appendix B

The power of where – geographic names supporting sustainable development

Sustainable development ensures that resources are safeguarded for future generations through planning and management. Almost all of the United Nations’ 17 sustainable development goals will require authoritative and reliable geospatial data to support policy decision-making, implement actions, and measure and monitor the goals.

Geographic names are a core theme in any geospatial dataset, and are a fundamental part of New Zealand’s spatial data infrastructure. They provide context and a framework to support the administration, management, governance and critical analysis of the environment and its resources. The New Zealand Geographic Board Ngā Pou Taunaha o Aotearoa (NZGB) makes official geographic names and other spatial information available in the New Zealand Gazetteer, which is accessible online for searching and viewing, and provides users with full and free download options of the data either as a csv file or through the LINZ Data Service.

By actively officially naming geographic features within its jurisdiction, and providing high quality, accessible, timely, consistent and reliable data, the NZGB contributes to managing places for scientific research, exploration and environmental management. The NZGB’s naming role in Antarctica also provides a consistent reference for Antarctic science, and guards against over-naming a pristine environment.

Ngā Pou Taunaha o Aotearoa: the memorial markers of the landscape

By looking to the past we can better prepare for the future. Names in the landscape are like survey pegs of memory so that the lessons of history are always present and available. Ancestral Māori lived in very close harmony with the natural world, especially the land and its resources. Many of New Zealand’s Māori geographic names describe not only the physical aspects of a feature, but provide information about the natural and cultural conditions at the time it was coined.15

Tāhuahua-Paopao-Karoro Island (Tahuahua: land mass, Paopao: the sound a baby chick makes as it emerges from an egg, Karoro: seagull) is an ancient Māori name that has been restored. The name derives from the use of the island as a habitat and food gathering area. Although the name refers to the abundant availability of seagull eggs on the island, it also references its former inhabitants’ abandonment. After suffering a calamitous storm that stripped the island of vegetation and fertile soils, an accompanying sea surge removed possibly more than nine-tenths of its land mass. Today we see only a small portion of what once was the island, now abandoned by its inhabitants, leaving only a habitat for the migratory godwits and seagulls to lay their eggs in abundance.16

The meanings and messages behind geographic names like Tāhuahua-Paopao-Karoro Island will become increasingly significant as global warming and other environmental changes make many of them obsolete. Geographic names not only describe the land physically, they can unlock its resources, provide practical information, and help future communities to adapt to their changing environments.17

16 New Zealand Gazetteer: Tāhuahua-Paopao-Karoro Island