0F1F2F3F4F2017 New Zealand SCAGI Report

Submitted by New Zealand to SCAR-SCAGI

Bremerhaven, Germany

Alfred Wegener Institute

Monday 12 June 2017 10am – 5.30pm
Tuesday 13 June 2017 9am – 12.30pm
1 New Zealand SCAGI Members

Graeme Blick  Chief Geodesist
Wendy Shaw  Secretary, NZ Geographic Board
Mark Dyer  Surveyor-General

2 LINZ¹ National Geodetic Office Survey Activities

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

- Continuing support of the POLENET project, by operating GNSS CORS stations at Cape Roberts and Scott Base, and support to the Butchers Ridge site.

- Maintenance, calibration and operation of tide gauges at Cape Roberts and Scott Base.

- Locating and constructing a new absolute gravity mark at Scott Base to replace the mark adjacent to the Scott Base flag pole.

- Deformation surveys of:
  - Scott’s Hut at Cape Evans
  - Hillary’s TAE Hut at Scott Base; and
  - Wind turbines at Crater Hill, Scott Base
  - Scott’s Discovery Hut at Hut Point

¹ LINZ: Land Information New Zealand, a government department principally responsible for processing cadastral surveys, land title registrations, topographic mapping, hydrographic charting, Crown property management, property transactions by overseas investors, etc.
• Monitoring surveys of:
  o Cliff survey at Hutt Point

3 LINZ National Hydrographic Authority Charting

LINZ is extending its hydrographic activities in Antarctica by:

• Reviewing and incorporating into existing charting of the Ross Sea Region bathometric data from scientific voyages in the Ross Sea provided by GNS Science.

• Investigating ships that may provide an opportunity to acquire bathometric 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

No mapping activities have been undertaken in the past year.

5 NZGB\(^2\) official NZ Antarctic name of interest

<table>
<thead>
<tr>
<th>Official Geographic Name</th>
<th>Authority</th>
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<tbody>
<tr>
<td>Naish Peaks</td>
<td>New Zealand Gazette 2016-ln6042</td>
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</tbody>
</table>

Description

A 7km line of peaks up to 2874m high on an east–west trending ridge, between Dominion Range’s interior ice cap and the ice-free Meyer Desert to the north. Located on Dominion Range, upper Beardmore Glacier. Depicted on NZMS166 SV51-60/8 and USGS Reconnaissance SV51-60/8 1:250k topographic maps.

Named for Professor Timothy Naish, Director of Victoria University of Wellington’s Antarctic Research Centre. The name recognises Professor Naish’s highly successful Antarctic scientific career, particularly in the area of paleoclimatology. Professor Naish is well known for his leadership of the ANDRILL Project, was the 2014 recipient of the Tinker-Muse Prize for Science and Policy in Antarctica, and was elected a Fellow of the Royal Society of New Zealand in 2015. During the 2010-11 field season, Professor Naish and his colleagues worked at ‘Oliver Bluffs’, an area of exposed strata and fossil deposits on the north of Dominion Range - a site overlooked by Naish Peaks:

\(^2\) NZGB: New Zealand Geographic Board, an independent statutory body of government administered by LINZ through a Secretariat. Responsible for official geographic names in New Zealand, its offshore islands, its continental shelf and the Ross Dependency of Antarctica.
6 Rationalising the NZGB Gazetteer and SCAR CGA

The NZGB assumes responsibility for keeping SCAR up to date with New Zealand’s naming decisions. Recording New Zealand names in the SCAR CGA:
(1) helps promote New Zealand’s interests in Antarctica,
(2) helps prevent features from being named again by other countries, and
(3) provides a common reference framework for those working in Antarctica.

In June-July 2015 the NZGB found that of the approximately 3500 New Zealand Antarctic place names recorded in the [New Zealand Gazetteer](#) (at the time), over 1000 were not recorded in the SCAR CGA.

In April-May 2016, Jacqueline Müller at Università di Siena (on behalf of SCAR CGA) noted a variety of further issues with the New Zealand names. The most concerning was that a large number of names sent to the SCAR CGA had no ‘authority’ reference – it was unclear whether the names were official in New Zealand. The issues raised by Jacqueline Müller highlighted and added to a body of issues previously noted with New Zealand’s Antarctic names.

As at March 2017 and after further investigation, the difference between SCAR CGA and the New Zealand Gazetteer increased to more than 1500 names. Several hundred names approved by the NZGB’s former APNC\(^3\) were found to be missing from the New Zealand Gazetteer. This difference may increase as further missing names are identified, processed and added to the New Zealand Gazetteer.

This issue arose due to many decades of not publishing a Gazetteer of New Zealand’s Antarctic naming decisions:
- New Zealand’s Antarctic naming decisions were published from 1958 to 1964 in the Provisional Gazetteer of the Ross Dependency and its four Supplements.
- From 1964 to 1996 no further New Zealand Gazetteers of Antarctic names were compiled. During this time US-ACAN maintained its own Gazetteer of Antarctic names. The US-ACAN Gazetteer generally reflected APNC decisions accurately due to the longstanding arrangement on Antarctic naming between NZ and the USA.
- From 1996, the NZGB began listing Antarctic names in a spreadsheet Gazetteer, in response to the establishment in 1992 of the SCAR CGA under the framework of SCAGI\(^4\) to compile all existing Antarctic names, and promote order and consistency internationally. The

\(^3\) APNC – Antarctic Place Names Committee

\(^4\) SC-AGI - Standing Committee on Antarctic Geographic Information
spreadsheet Gazetteer from 1996 onwards was built upon with corrections and new names, through to the present.

## 7 Coordinate improvements

In addition to correcting errors and completing rationalisation with SCAR CGA, the NZGB has been active in SC-AGI’s initiative to improve current coordinates for Antarctic features.

Coordinate accuracy in the NZGB Gazetteer is variable. Many coordinates are unchanged from publication in the *Provisional Gazetteer of the Ross Dependency* in 1958, New Zealand’s first Antarctic Gazetteer. In some cases the ‘correct’ official coordinates are out by 20km from the feature, possibly scaled from old and inaccurate ‘Heroic Age’ maps.

Until recently, coordinates to the nearest minute were also considered appropriate for most naming in Antarctica. This reflected the use/listing of Antarctic names by publication on maps. However, this is no longer sufficient with the increasing use of geographic information as data and a need for greater precision.

The NZGB notes that US-ACAN, British Antarctic Survey (BAS) and the Australian Antarctic Division (AAD) have also identified the need to improve their place name coordinates to meet current expectations.

To assist this initiative, rectified Antarctic satellite and mapping resources managed by the Polar Geospatial Center (PGC) at the University of Minnesota, USA, were made available to the NZGB. In addition to NZGB archives, these other resources were used: aerial and oblique photography also available from PGC, historic maps in published books by the early explorers, current topographic maps, current hydrographic charts and data published by LINZ.

![Diagram showing coordinate improvement examples in Allan Hills](image)

*Imagination examples in Allan Hills – triangles are existing positions, circles corrected positions.*
8 Methodology

Between October 2016 and February 2017 the NZGB extensively reviewed the New Zealand Antarctic names dataset.

The project required the reconstruction of APNC decisions from disparate and incomplete records, ensuring that the names were positioned at the features originally intended to be named. The coordinates for every name considered by the ANC\(^5\) were assessed and where applicable, improvements proposed.

This project identified more than a hundred significant errors including coordinate transposition, spelling errors, incorrect feature types, and replaced names made official in addition to the names that replaced them. Many of these errors will also require correction in the SCAR CGA, eventually.

Other accomplishments include:
- Processing and adding approximately 300 official names that were missing from the New Zealand Gazetteer.
- Reviewing the orthography for every Māori name in Antarctica.
- Linking in the New Zealand Gazetteer all replaced names to the names that replaced them.
- Completing outstanding investigations for 419 names from the ‘names without source’ and ‘names without position’ spreadsheets. These names were not previously validated under s.35 NZGB Act 2008 as they were either missing source references, eg. Minutes, or the positions of the features were unknown.

The NZGB notes corrections will be required to current LINZ AntTopo50 maps. The LINZ Mapping team will be advised of corrections to their products once names and corrections are officially notified in the New Zealand Gazette.

9 NZGB Decisions – May 2017

<table>
<thead>
<tr>
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<th>Various</th>
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<tbody>
<tr>
<td>6</td>
<td>Various</td>
<td>s. 25 assign</td>
</tr>
<tr>
<td>33</td>
<td>Various</td>
<td>s. 25 alter</td>
</tr>
<tr>
<td>547</td>
<td>Various</td>
<td>s. 35 validate</td>
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<tr>
<td>165</td>
<td>Various</td>
<td>Amending Gazettes (mostly improving position, with some spelling corrections)</td>
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<tr>
<td>38</td>
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<td>Confirm</td>
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<tr>
<td>1</td>
<td>Scott Island Bank</td>
<td>DEFER</td>
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<tr>
<td>74</td>
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<tr>
<td>58</td>
<td>Various</td>
<td>DEFER</td>
</tr>
<tr>
<td>922</td>
<td>TOTAL</td>
<td></td>
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\(^5\) ANC – Antarctic Names Committee
10 NZGB future work

Once decisions are notified in the *New Zealand Gazette*, the NZGB can resume rationalisation with SCAR CGA to ensure all of New Zealand’s names are accurately listed. The NZGB will undertake mapping of New Zealand feature types to their equivalent feature types in the SCAR CGA. The NZGB will also need to review and update the SCAR-ID annotations in the New Zealand Gazetteer, which have not been maintained since Gazetteer migration in 2013.

Assessing and improving coordinates for the balance of New Zealand’s Antarctic names (approx. 2500) will take time.
- Approximately 800 names are covered by LINZ’s 1:50k topographic mapping. While LINZ Topographic produced new, accurate coordinates for feature names in the 2012 map release, there are risks in accepting these coordinates without further checks. The NZGB needs to verify that LINZ correctly identified the named feature on its maps.
- The remainder of the names mostly fall within areas of older topographic maps (1960’s) at 1:250k scale. While the NZGB has the tools to improve these names (including relatively recent US maps, data, and satellite imagery) each name/feature may require individual examination.

The NZGB has at least a further 200 names to process that are missing from the New Zealand Gazetteer and that were approved by the APNC. Processing these names will again include assessment and improvements of the coordinates. Despite the names are missing from the New Zealand Gazetteer, and not having been notified in the *New Zealand Gazette*, they are still ‘official’ (valid) under s.35 of the *NZGB Act 2008*.

11 New Zealand Annual Science Conference, 26-28 June 2017

The NZGB will be presenting a poster at this bi-annual conference in Dunedin, focussing on improving feature coordinates for place names in the Ross Sea Region of Antarctica.

12 NZGB online Gazetteer

This project was reported to SC-AGI at its last meeting in 2016 in Kuala Lumpur. The new online Gazetteer platform has not gone into production yet. The NZGB hopes for its launch before the end of 2017.

The main issues with the current online *New Zealand Gazetteer* is that it cannot display the full geographic extent of the NZGB’s jurisdiction, which includes Antarctica and New Zealand’s extended continental shelf (undersea). Other shortfalls are in displaying complex geometry (lines and polygons), advanced searching, and basemap options.