

2nd GRUAN Implementation-Coordination Meeting (ICM-2)

Payerne, Switzerland
2-4 March 2010

Item 7.2.5

Site report: Lauder, New Zealand

(Submitted by Paul Johnston)

Summary and Purpose of Document

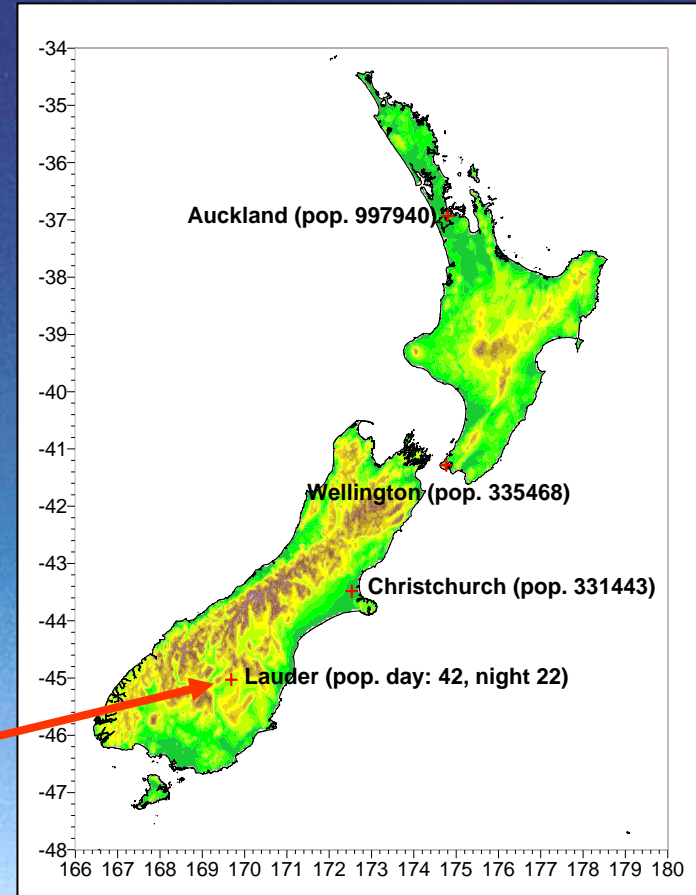
This document contains an overview of the measurement programme at the Lauder site with respect to GRUAN requirements, and addresses the questions to be discussed in this session.

7.2.5 New Zealand – Lauder Site Report
Second GRUAN Implementation-Coordination Meeting

Payerne, Switzerland
2-4 March 2010

Paul Johnston, NIWA

NIWA's Lauder Site
45.0°S, 169.7°E
370m a.s.l.



Sondes - Temperature and Water Vapour

Candidate site Lauder is not currently nationally funded for GRUAN operations.

1. Which of your existing radiosonde launches already meet the mandatory requirements (GCOS 121: once weekly best production quality radiosonde, once monthly stratospheric water vapour; recommended twice daily), and which additional launches need to be instigated or augmented?

We fly a radiosonde together with an ECC ozone sensor, surface to ~ 32 km weekly.

Two configurations used, aimed for on alternative weeks:

- RS92-SGP radiosonde with an EN-SCI Z1 model ECC Ozone sensor and GPS.**
- I-met 1 RSB radiosonde with EN-SCI Z1 model ECC Ozone sensor and GPS plus a “Micro Controlled Digital Frost Point Hygrometer” (thanks to NOAA support).**

Sondes are pressure tested at 10 hPa. to correct pressure sensor offset and slope. Marwin processing is available, but not used for ozone profiles. Our processing provides higher time resolution (1 sec RS92, 3.6 sec I-met).

Tier 3, Regular 00 and 12 LST launches, are **not supported at Lauder (not funded).**

QUESTION: the New Zealand Met. Service makes GUAN measurements at their Station at Invercargil, 187 km from Lauder, using RS92-K sondes. Would this temperature data meet Tier 3 requirements for a GRUAN station at Lauder?

Guidelines/manuals & Data dissemination practice? - NDACC/WMO/BSRN

2. Which ground based measurements can you provide in addition to the mandatory GPS total water vapour column (microwave, FTIR, lidar, ...) and how can you use these additional observations to make sure that measurement uncertainty estimates will be consistent?

Mandatory GPS receiver (GPS PW): Not currently installed but this is being planned for Lauder with NOAA support. Date to be determined.

INFORMATION: our existing atmospheric chemistry and NDACC work is funded by the New Zealand Foundation for Research Science and Technology (FRST) within the Drivers and Mitigation of Global Change (DMGC) programme.

List for additional G-B instruments (GCOS-112, priority2) encompasses six instruments-

- *surface radiation instruments:* **BSRN Station at Lauder (BOM and FRST funded)**
- *microwave radiometer:* **Not supported.**
- *multi-channel infrared radiometer (e.g. FTIR):* **Not supported.**
- *Lidar (e.g. Raman Lidar):* **Aerosol Lidar operated collaboratively with NIES (under GOSAT project).**
- *integrated trace gas measurements and sun photometer:* **Partly supported.**
- *cloud radar (may also be useful):* **Not supported.**

3. Do you have any limitations regarding the development of GRUAN launch protocols for routine and reference sonde launches (e.g. the use of autosonde launchers)?

We support the principal of standardisation of launch protocols (we have long experience with NDACC's similar practices):

- For Tier 3 we envisage a launch process similar to that at Lindenberg with a suitable “tall door” building designed for the purpose. Will require funding for this.**
- We currently launch weekly sondes outside in the lee of a tall wall built for launches. We experience strong winds on occasions.**
- Autosonde launchers sound operationally desirable, but the cost seems prohibitive.**



4. Do you have any limitations regarding the development of uniform GRUAN data processing schemes for remote sensing observations?

Will depend on how a GRUAN station is established at Lauder. If we can get funding for GRUAN independent of our existing DMGC programme funding from FRST, then GRUAN data processing practice would be expected. If we use existing NDACC sonde measurements for GRUAN then existing NDACC processing would be used. The GRUAN requirement seems little different to existing NDACC procedures.

5. What local analysis can you provide to assure that measurements uncertainties will be consistent across the network (Analysis of redundant observations either dual sonde launches or sonde + remote sensing observations)?

Would depend on funding. We do at present occasionally fly two sondes on one payload to compare new sondes.

6. For sonde observations: Can you provide all raw data for central archiving?

Probably: Existing NDACC practice encourages free flow of all data, but copying costs may need to be considered.

A most important requirement for us is to make some use of new science in the data before it goes public, or our contribution to be recognised in papers, conference presentations and reports that use Lauder data. Our FRST funding contract requires this.

7. For remote sensing observations: Will you be able to archive all raw data for possible future Reanalysis and reprocessing?

Is current practice for all NDACC data at Lauder. Raw archives are write once.

8. What help do you need from the Lead Centre / WGARO / GCOS Secretariat in moving forwards?

Help from the Lead Center to choose a GPS PW system for Lauder would be much appreciated. Once we know the cost we will explore how we fund it.

9. Will you be able to host local intercomparison campaigns (yet to be scheduled)?

Possibly. We have hosted a number of NDACC campaigns (Lidar, Ozone, UV-Vis, FTIR, etc) and the main limit is the capacity of our facilities.

10. Are there any special infrastructure needs that should be addressed?

Depends on the outcome of the investigation as to whether the NZ Met. Service's Invercargill GUAN sonde measurements satisfy the Tier 3 protocol. Unfortunately a Tier 3 radiosonde program will be difficult to establish at Lauder in the current financial climate.

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