

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

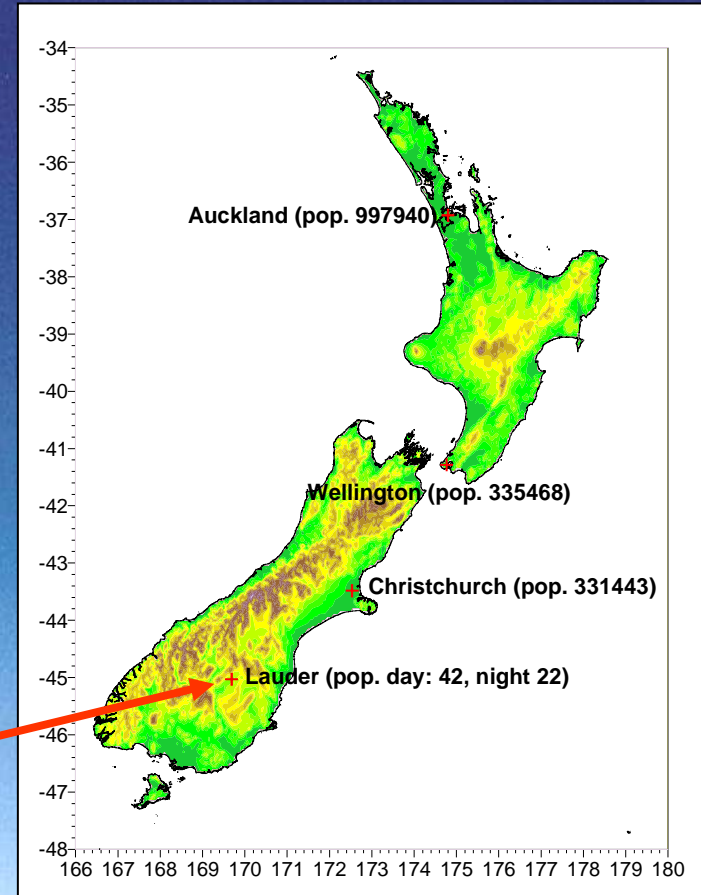


New Zealand – Lauder Site Report
Third GRUAN Implementation-Coordination Meeting

Queenstown New Zealand
28 February - 4 March 2011

Paul Johnston, NIWA

NIWA's Lauder Site
45.0°S, 169.7°E
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Lauder is currently not nationally funded for GRUAN operations.

Have support from NOAA to make frost point hygrometer (FPH) flights and towards aligning relevant NDACC measurements to meet GRUAN specs.

GCOS-121 Radiosonde Site Requirements:

*1 x weekly production radiosonde with the best technology currently available at the site.
1 x monthly radiosonde capable of capturing moisture signal in the UT/LS and all other priority 1 variables to the best level possible with current technology, launched together with weekly radiosonde.*

- We aim to fly a radiosonde together with other sensors, surface to ~ 32 km weekly.
- Two measurement configurations are used:
 1. An RS92-SGP with an EN-SCI Z1 model ECC Ozone sensor and GPS receiver.
 2. An I-met 1 RSB radiosonde with an EN-SCI Z1 model ECC Ozone sensor; GPS & NOAA FPG (under contract). (Most of 2010 cal year an RS92 was also added to improve the consistency of the weekly measurements (GRUAN “best technology currently available”).

Note: During the 2010 calendar year we were unable to meet the weekly schedule for radiosonde flights and the monthly schedule for FPH flights.

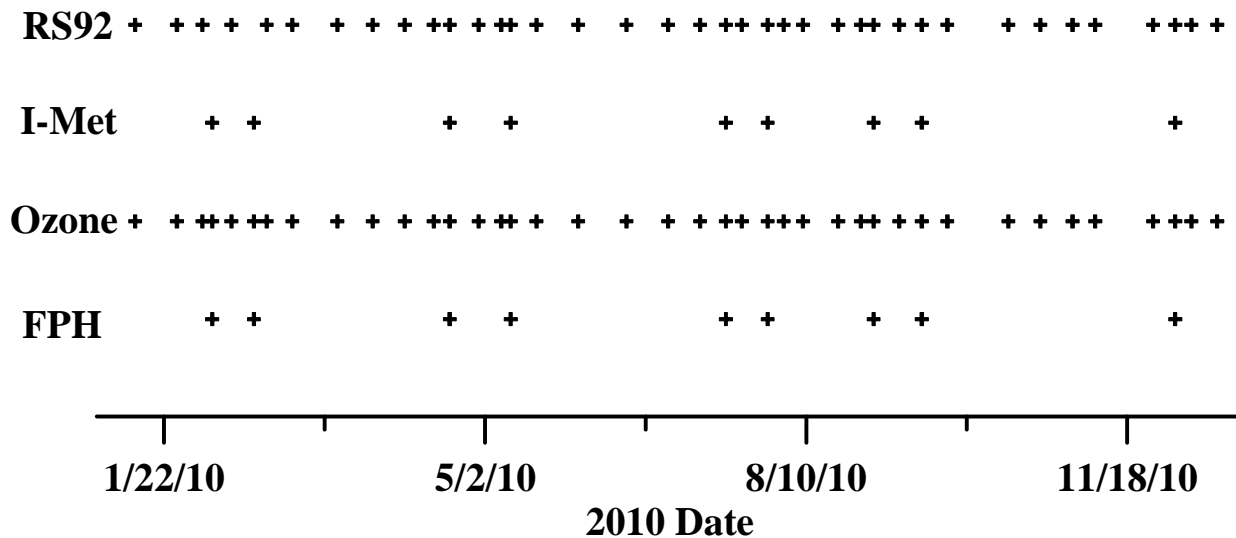
Factors: staff under houred (lower funding → two part-time operators) & limited FPH components over part of the year.

However, we have now allocated time for three part-time operators which will reduce the occurrence of no operators being available some weeks.

Discussion with NOAA → improved FPH parts stock reporting system. Reduction by NOAA to 1 FPH per month in 4th quarter 2010 will also be more realistic for us.

Successful in obtaining special NIWA funding to augment Lauder ozone programme for the current financial year. Uncertain July 2011 – June 2012 financial year status.

Table of radiosonde (RS92 and IMet), Ozonesonde and FPH flights during the 2010 calendar year.



Radiosonde Calibrations and Processing

- **RS92-SGP sondes are pressure tested in a vacuum chamber pre-flight at 10 hPa. and combined with ground pressure measurements to correct pressure sensor offset and slope.**
- **Marwin ground station processing is available, but not used for ozone profiles. These are processed using modified Viasala ground checks – multiple Temp, Press, and Humidity tests are averaged and applied to flight data after the flight. The flight data are processed using an in-house computer program for higher temporal resolution (1 sec).**
- **Ozone EEC: WMO standard operating procedure, with 0.5% buffer soln, 3 mils of cathode soln.**

Data availability

These data are available through the NDACC and WOUDC archives.

Guidelines used

NDACC and WMO guidelines are used for radiosonde and ozone measurements.

Data dissemination practice

Currently NDACC, but alternative quicker release of data will be possible.

Ground-Based Instrumentation and Observing Practices

The minimum set of ground-based instrumentation is to have a ground-based GPS receiver to measure total column water vapour (GPS PW) at each GRUAN site:

Not supported (plan to apply for NIWA capital to obtain a suitable GPS).

The list for additional ground-based instruments (GCOS-112, priority 2) encompasses six instruments

1. Surface radiation instruments:

Lauder BSRN Station Measurements are:

- **Incoming Longwave Radiation – Pyrgeometer (BSRN)**
- **Aerosol Optical Depth – 4 wavelengths (412, 500, 610, 778 nm) (BSRN)**
- **Incoming Shortwave Radiation – Diffuse + Direct (BSRN)**
- **Cloud Optical Depth – Some (UVA Transmission using UV Spectroradiometer)**

The Lauder BSRN station is calibrated by the Bureau of Meteorology, Melbourne

2. Microwave radiometer None (other than O₃ & H₂O stratospheric emissions)

3. Multichannel infrared radiometer (e.g., FTIR): Bruker high res FTIR used for composition measurements (column & some profile info.)

4. Lidar (e.g., Raman Lidar): Only Aerosol Lidar making NDACC measurements

5. Integrated trace gas measurements and sun photometer: suite of composition measurements, NDACC trace plus greenhouse gases (CO₂, CO, CH₄, N₂O)

6. Cloud radar: none at Lauder

Lauder Resource Status:

Adding a GRUAN station, at an estimated NZ\$1 million/year for a 2 radiosonde flights a day operation together with the other priority 1 & 2 measurements is beyond our current resources at Lauder.

We very strongly embrace the vision and goals of GRUAN, and recognise the urgency of better balancing the hemispheric coverage, but unfortunately the current funding situation in New Zealand makes increased resource support unlikely for now. However, together with the Permanent Representative of New Zealand with WMO, we will continue to explore every opportunity.

Maybe working with the NZ Meteorological Service's GUAN Station in Invercargill, 180 km away, could provide an adequate twice daily radiosonde protocol?

With continuing support from NOAA we expect to maintain our weekly best-available radiosonde programme, and water vapour measurements.

The existing levels of NDACC trace specie, column and in-situ carbon, and radiation measurements are expected to be reviewed and some may be reduced due to the current economic situation.

Possible Future Developments:

If researchers from other countries wanted to use the Lauder site for their GRUAN experiments we would endeavour to host them (this may need to be cost neutral to us).



Acknowledgements

WG-ARO

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