

Report by **Kevin Hall**, Visiting Professor 2014-15
visit to **Rhodes University**, South Africa, May 2015

In summary:

- three days were spent at University of Pretoria en route to Rhodes
- a research/writing workshop was run at Rhodes University from 13-23 May
- a public lecture was given in the evening of May 21st
- time was spent with current Antarctic researchers and with those planning to go
- help was given for theses relating to the Antarctic work.

Arriving ahead of the planned workshop (to deal with jet lag), three days were spent with faculty and graduate students at the University of Pretoria. Discussions were had with Prof Sumner and several post-grads who were working on weathering projects (including laboratory simulations) that had connections with, and using samples from, previous studies on sub-Antarctic Marion Island. In addition, a lecture was given to undergraduate students regarding the monitoring of weathering processes.

From 13-23 May the time was devoted to the primary goal of the Antarctic researchers, under the leadership of Prof Ian Meiklejohn, at Rhodes University, Grahamstown. This group is working both in the sub-Antarctic (Marion Island) and on the continent (Western Dronning Maud land). The 14th to 22 May was spent with the present and future graduate students working in the Antarctic, discussing their research projects, their current and proposed theses. Much time was also spent with Prof Meiklejohn discussing the overall nature of the research on the continent and Marion Island – what was being done, how it was being done, and what might be done in the future. These discussions also helped better understand both the theses being undertaken and the planned future graduate students.

From 18-22 May a workshop was held (from 0800 to 1800hrs daily) regarding the writing up of the research for publications. It should be noted that all of this was quite a challenge as South Africa, going into winter, was suffering “rolling blackouts” of electricity that daily impacted computer power! Time was spent with each graduate, going over the nature of their work and how best to write that up for the specific journal identified as best suited for that work. In addition, time was also spent on discussing the broader perspectives of the work and how it had been undertaken as a learning exercise, for both them and myself, in quite what the data really said and how the work might be better done or extended as part of the overall Antarctic Programme.

On the evening of May 21st, thankfully just as a blackout ended, a public lecture was given on the title “*Antarctica - a continent (?) for science (?)*”. It was well attended, given the blackout situation, by faculty, graduate, and undergraduate students from several departments, plus a goodly number of non-university people who had seen the advertising for the talk. The theme of the lecture was around the fact that Antarctica is made up of more than just the continent and that, even there, it has a variety of environments. This was combined with what (from my earth-science perspective) the nature and meaning/direction of the

research might be. The aim was to encourage and enthuse the students, who seemed to greatly enjoy the stimulation to the point that I was asked back again in 2016 to undertake further work with them, and I have remained in contact with several to help them with both their work and other contacts who can be of benefit to them.

Outline of outcomes from the Workshop and the individual meetings:-

Submitted Papers:

- Kotze, C. & Meiklejohn, I. Temporal variability of ground thermal regimes at Vesleskarvet nunatak of Western Dronning Maud Land, Antarctica. (Accepted, pending changes).
- Rudolph, E., Meiklejohn, I. & Bumby, A. Rock glaciers observed in the Jutulsessen, Dronning Maud Land, Antarctica. (Rejected – to be resubmitted in May 2016).

Papers to be submitted in 2016:

- Dwight, R. & Meiklejohn, K.I. A method for determining the spatial variability of rock hardness values on a large dolerite boulder, Komga, South Africa. *Geomorphology*.
- Meiklejohn, I. & Kotze, C. Cloud vortices at the Prince Edward Islands. *Boundary Layer Climatology*.
- Meiklejohn, I. & Ayres, G. Mapping sub-Antarctic Marion Island. *Journal of Maps*.

Conference Presentations

International Conference on Permafrost, Potsdam, June 2016

- Active Layer Monitoring in Western Dronning Maud Land, Antarctica since 2007 (Meiklejohn, K.I., Kotze, C & Hansen, C.D.).
- Surface characteristics of rock glaciers in the Jutulsessen, Dronning Maud Land, Antarctica - Poster (Rudolph, E.M., Meiklejohn, K.I. & Bumby, A.).
- Short-term changes observed in the ground thermal regime following the construction of a building: A case study from the Antarctic - Poster (Hansen, C.D. & Meiklejohn, K.I.).
- Investigations into the ground thermal regime near Troll station, in the Jutulsessen of Antarctica: 2007-2016 - Oral (Hansen, C.D., Meiklejohn, K.I. & Nel, W.).

SCAR Open Science Conference, Kuala Lumpur, August 2016

- Active Layer Landforms and Environments in the Ahlmannryggen and Jutulsessen Areas, Western Dronning Maud Land, Antarctica (Meiklejohn, I.).
- The Geomorphology of a rock glacier, near Troll Station in the Jutulsessen, Antarctica (Rudolph, E.M., Bumby, A. & Meiklejohn, K.I.).
- Characteristics of Tafoni in Western Dronning Maud Land, Antarctica. (Rosenfels, J. & Meiklejohn, I.).
- Observations on frost mounds in the Jutulsessen, Antarctica, (Hansen, C.D., Loubser, M.J. & Rudolph, E.M.).

SAAG (Southern African Association of Geomorphologists) Conference at Sani Pass, Lesotho in September 2015.

- Review and application of needle ice creep models on sediment movement, Marion Island, sub-Antarctic (Borg, C-J.).
- A spatial and temporal analysis of active-layer dynamics in Western Dronning Maud Land, Antarctica. (Kotze, C. & Meiklejohn, I.).

- Topographic and climatic forcing observed on ground surface temperatures. (Hansen, C.D., Meiklejohn, I. & Nel, W.).
- Environmental and topographical controls on lichen colonisation of Vesleskarvet in Western Dronning Maud Land, Antarctica. (Ayres, G.).
- Landscape processes in Antarctic ecosystems. (Meiklejohn, I., Nel, W., Hansen, C., Lee, J., Matcher, G., Dwight, R., Scott, D., Kotze, C., Rudolph, L., Ayres, G., Rosenfels, J., Hedding, D., Loubser, M., van der Merwe, B., le Roux, J. & Davis, J.).
- Characteristics of Tafoni formation: Observations from Western Dronning Maud Land, Antarctica. (Rosenfels, J.).
- Rock Glaciers observed in Jutulsessen, Gjelsvikfjella Mountain Range, Dronning Maud Land, Antarctica. (Rudolph, E.M., Meiklejohn, I. & Bumby, A.).

ISAES (SCAR Earth Sciences) in Goa, India, July 2015.

- Characterizing Active-Layer Dynamics on Selected Nunataks in Western Dronning Maud Land, Antarctica. (Kotze, C.).
- The Geomorphology of Rock Glaciers, near Troll Station in the Jutulsessen, Antarctica. (Rudolph, E.).
- An evaluation of diurnal temperature regimes for three study sites in Dronning Maud Land, Antarctica: Nonshøgda, Vesleskarvet, and Robertskollen. (Hansen, C.).
- Review and application of needle ice creep models on sediment movement, Marion Island, Sub-Antarctic. (Borg, C.-J.).

Postgraduate Degrees

Completed:

- Rosemary Dwight (MSc 2015): Geomorphic and ambient environmental impacts on lichen distribution on two inland Nunataks in western Dronning Maud Land, Antarctica.
- Camilla Kotze (MSc 2016, *Cum Laude*): Active Layer Dynamics at Four Borehole Sites in Western Dronning Maud Land, Antarctica.
- Elizabeth (Liesel) Rudolph (MSc 2016, *Cum Laude*): Surface characteristics of rock glaciers in the Jutulsessen, Dronning Maud Land, Antarctica.

To complete in 2016:

- Carl-Johan Borg (PhD, to submit in May): Identifying growth criteria and sediment movement mechanisms of needle ice using high-frequency environmental and visual monitoring. (*He was not at the workshop*).
- Christel Hansen (PhD, to submit in July): On High-Altitude and High-Latitude Diurnal Frost Environments.
- Gabrielle Ayres (MSc, to submit in November): Habitat preferences of lichens in Western Dronning Maud Land, Antarctica.
- Jessica Rosenfels (MSc, to submit in November): Characteristics of Tafoni in Western Dronning Maud Land, Antarctica.

New students (to complete in 2017)

- Jenna Knox (MSc): Chemical weathering landforms on nunataks in Western Dronning Maud Land, Antarctica.
- Tebogo Masebe (MSc): Seasonal, Synoptic and Diurnal atmospheric influences on active layer thermal regimes on the Ahlmannryggen, Antarctica.
- Nicloa Wilmot (MSc): Periglacial Geomorphology of the Ahlmannryggen, Antarctica.