**Curriculum Vitae**

Name: Janet Richardson
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**Education and awards**

2012-present **University of Leeds**
PhD: Antecedent fluvial systems on an uplifted continental margin: constraining Cretaceous to present-day drainage basin development in southern South Africa.
Supervisors: David Hodgson (University of Leeds), Andreas Lang (University of Liverpool), Jonathon Carrivick (University of Leeds), Andrew Wilson (Chemostrat, Australia).
Funding: University-funding.
Other funding applied for: British Society for Geomorphology (1st February 2015), AAPG aid-in-action (15th February 2015).

2011-2012 **Aberystwyth University**
MPhil: Controls on the location, development and significance of bedrock reaches on the middle River Rheidol, west Wales.
Supervisors: Stephen Tooth and Hywel Griffiths.

2008-2011 **Royal Holloway, University of London**
Degree: First class (Hons) BSc Physical Geography and Earth Sciences
Dissertation: An investigation on the spatial variation of stream power and sediment size; a case study of the Glendassan River, Ireland.
Awards: Science Faculty Harrison Prize for achieving the highest grade for a joint student.
Nominated for the Science, Environment and Technology 2011 award for the Earth and Environmental Sciences category. Dissertation nominated for British Society for Geomorphology and Quantitative Methods Research Group prizes.

**Membership of professional bodies**

2012 – present British Sedimentological Research Group
2012 – present British Society for Geomorphology (BSG)
2015 – present Society for Sedimentary Geology

**Conferences**

Richardson, J, Hodgson, D, Lang, A and Wilson, A. Hypsometry and geology of drainage basins: toward understanding the long term landscape evolution of southern South Africa. International conference of Geomorphology, Paris, 2013.

Richardson, J, Tooth, S and Griffiths, H. Process and rates of bedrock erosion in Welsh

Rivers, and the implications for long term landscape development. International conference of Geomorphology, Paris, 2013.

Richardson, J, Hodgson, D, Lang, A and Wilson, A. Hypsometry and geology of drainage basins: toward understanding the long term landscape evolution of southern South Africa. BSRG AGM, Hull University, 2013.

Richardson, J, Hodgson, D, Rawcliffe, A, Lang, A and Wilson, A. Where are my fans? The onshore depositional record of widespread exhumation of southern Africa in the Cretaceous. BSRG AGM, Nottingham, 2014.

**Referee**

David Hodgson,
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**Research**

My research focuses on the long term landscape evolution of southern South Africa. Despite widespread interest in the landscape since Lester King's seminal work in the 1950's, critical unknown components of the geological history include: the volume of material removed; the switch from deposition to incision; the rates of incision; and the drivers of fluvial antecedence seen within the region. Investigating long term landscape evolution can help refine understanding of the relationship between hinterland erosion in drainage basin(s) and the volume and character of sediment deposited offshore. Using modern techniques, such as remote sensing, apatite fission track thermochronology combined with recent advances in the cosmogenic nuclide dating, this projects aims to unravel the landscape development of the Western Cape, with a focus on the Gouritz drainage basin (Figure 1).

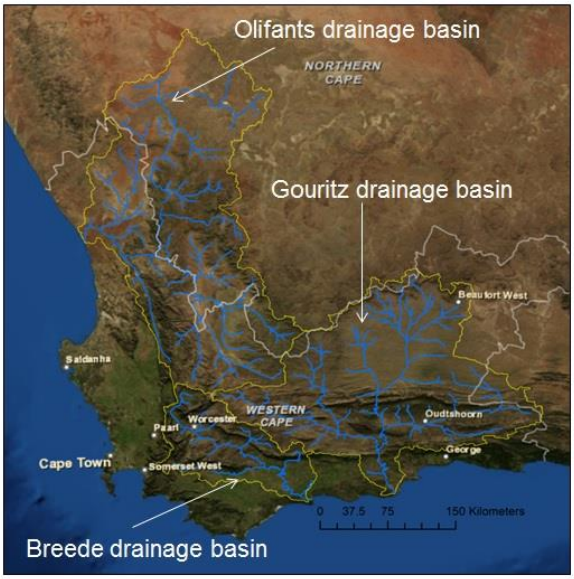


*Figure 1 – Antecedent drainage basins of the Western Cape.*

Landscape development has been extensively researched for the Orange River Catchment, and the development and retreat of the Great Escarpment. However, the catchments to the south are understudied despite supplying 4 offshore basins. My primary research questions are:

1) How can remote sensing techniques be used to calculate morphometric indices from the Gouritz drainage basin to constrain drainage evolution?
2) What are the long-term and modern rates of surface lowering and catchment denudation using cosmogenic sampling?
3) How can Cretaceous onshore deposits be used to inform long-term evolution of the drainage basin?

Previous dating attempts for the Western Cape are limited to 10 small Cape Fold Belt draining catchments (Scharf et al. 2013) and one apatite fission track transect (Tinker *et al*. 2008). Through integration of dating of surfaces (pediments), point source erosion rates (using previous river surfaces) and trunk river samples to constrain average catchment denudation rate, the history of the Gouritz basin will be better constrained.

Field work has focussed on the Gouritz drainage basin (Figure 1), with 33 samples collected for cosmogenic analysis, which will be undertaken in Université Catholique de Louvain under the supervision of Dr. Veerle Vanacker. The samples have been collected, crushed and are ready for analysis. My research grant has funding covered for 20 samples.

In this application, I am requesting funding to permit the analysis of 3 additional samples that have been collected from a new location (Seweweekspoort), one of three deep narrow gorges that cuts through the quartz-rich Cape Fold Belt and shows evidence of previous river heights (strath terraces) in multiple locations (Figure 2a, b). Due to the multiple erosion surfaces, and the high quartz content, cosmogenic dating will be very effective in this location. Compared to the other two breaches, this location is the most accessible, and has the greatest number of erosion surfaces. This will allow the long term history of the river incision to be constrained for the first time. The catchment has also been subject to stream capture, which has important implications for sediment supply and sediment routing. The timing of this capture and the breaching of the Cape Fold Belt, will help in reconstructing the drainage pattern when onshore Cretaceous basins were formed, depositing the only onshore representation of the peak erosion during the Cretaceous.

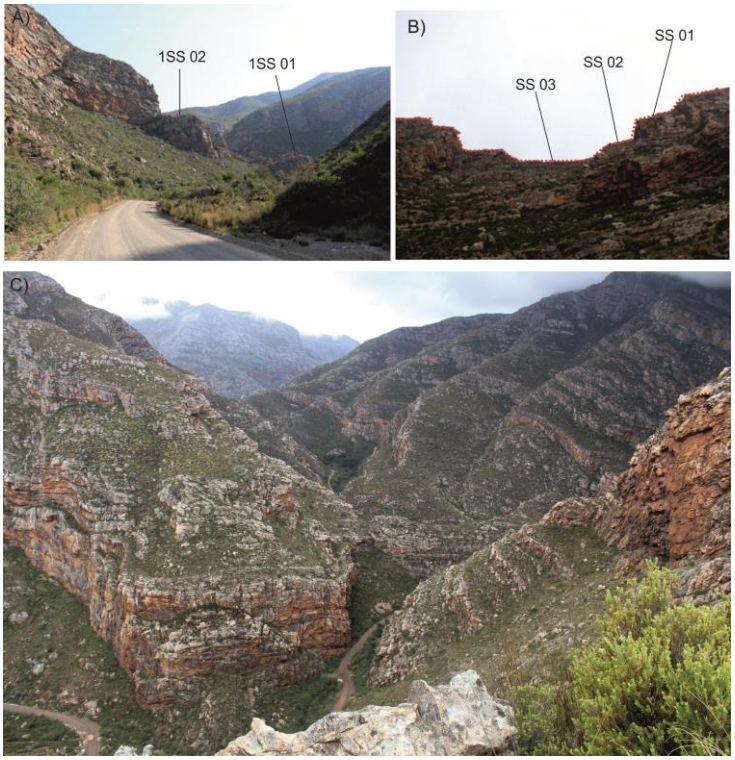


*Figure 2 – A and B) Previous river levels that have been sampled and, C) Seweweekspoort showing the deep gorge.*

**Budget**

If successful, the Gill Harwood funding will allow the analysis of 3 additional samples that will further help constrain the onshore development of drainage basins in South Africa. Recent technological advances have led to cosmogenic dating becoming a more significant component of my PhD than originally planned.

The funding applied for (£900) will help date samples using cosmogenic nuclides (£300/sample). The final stages of lab work with Dr Vanacker are planned for early 2015. The money from the BSRG will be used to date a previous river channel (Figure 2b).

The additional balance for dating the other samples collected during the research will be raised by my research grant and additional funding applied to from the British Society of Geomorphology (BSG) and AAPG grants-in-aid.

Table 1 – Cosmogenic dating costs associated with the project.

| Location | Cost per sample | Number of samples | Total | BSRG funding | Additional funding applied for |
|---|---|---|---|---|---|
| Seweweekspoort | £300 | 12 | £3600 | **£900 applied for, for 3 samples.** | BSG and AAPG |
| Pediments | £300 | 10 | £3000 | | |
| Trunk River | £300 | 11 | £3300 | | |
| | | | **£9900** | | |