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## A field reconnaissance to locate the base of the Changhsingian Stage in the Karoo Basin, South Africa

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The main Karoo Basin in South Africa contains a comprehensive sequence of Late Carboniferous to Early Jurassic sedimentary rocks of Gondwana. For our study, we looked at the lower Beaufort Group, focusing on the Balfour Formation (Wuchiapingian to Changhsingian), which contains a continuous record of Permian therapsid faunas. The *Dicynodon* Assemblage Zone appears near the base of the Balfour Formation at 255.2 Ma [1]. The top of the Balfour Formation corresponds with the Permian-Triassic boundary, dated in the type section at 251.9 Ma [2]. The base of Changhsingian stage is dated at 254.14 Ma [3], and therefore lies somewhere within the Balfour Formation.

Field work was undertaken in the Eastern Cape to investigate the Balfour Formation on the following sites: Fort Beaufort [4], Cookhouse-Cradock and the Old Wapadsberg Pass. Four members of the Balfour Formation, the Oudeberg, Daggaboersnek, Barberskrans and Palingkloof, had been mapped previously in the Cookhouse-Cradock and Old Wapadsberg Pass areas. In the Fort Beaufort area, we located the base of the Daggaboersnek Member at a site close to a previously recognized first appearance of *Dicynodon/Daptocephalus* [5].

The *Dicynodon/Daptocephalus* assemblage zone has been recently revised and separated into Lower and Upper *Daptocephalus* Assemblage Zones [6] with the boundary close to the lithostratigraphic boundary between the argillaceous Daggaboersnek Member and the arenaceous Barberskrans Member. In the northern Free State, the distal facies of the Balfour Formation is represented by the Normandien Formation. Here the boundary between the argillaceous Frankfort Member and the arenaceous Rooinek Member corresponds with a change in informal plant assemblage zones [7]. The boundary between the argillaceous southern Daggaboersnek and northern Frankfort Members and the arenaceous southern Barberkrans and northern Rooinek Members therefore corresponds with a faunal boundary in the south and a floristic boundary in the north. This boundary is considered as a candidate for the Changhsingian boundary in the Karoo basin.

### References:

[1] Rubidge B et al. (2013) *Geology* 41:363-366

[2] Burgess SD et al. (2014) *Proc Natl Acad Sci* 111:3316-3321

[3] Cohen KM et al. (2013) *Episodes* 36:199-204

[4] Catuneanu O and Elango HN (2001) *Sedimentary Geology* 140: 291-313

[5] Kitching JW (1977) Bernard Price Institute for Palaeontological Research, University of the Witwatersrand, Johannesburg. *Memoir* 1, 131 pp.

[6] Viglietti PA et al. (2016) *Journal of African Earth Sciences* 113:1-12

[7] Claassen M (2008) *South African Journal of Geology* 111:263-280

