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New insights into the late Paleozoic evolution of the New England Orogen (eastern Australia) in view of the recent paleomagnetic data

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The New England orogen is the youngest segment of the eastern Australian Tasmanides. It was developed as an accretionary orogen during the late Paleozoic to early Mesozoic
Gondwanide Orogeny (310–230 Ma) that extended along the Pacific margin of the
Gondwana supercontinent. The orogen exhibits a doubly vergent oroclinal structure with southern (Manning orocline) and northern (Texas – Coffs Harbour orocline) segments displaying S- and Z-shaped sets of oroclines, respectively. These opposite vergences led to contrasting models of formation. Cawood et al. (2011) proposed an animated model for the paleomagnetically permissive evolution of the orogen. However this model is not unique due to the limited number of reliable paleomagnetic data. In particular, the northern Texas – Coffs Harbour orocline has been strongly underrepresented paleomagnetically. Additionally, the previously published results of paleomagnetic studies in the North Tamworth terrane involved rocks which are c. 20 m.y. younger than the paleomagnetically studied rocks from the southern (Manning) orocline. Recently we collected oriented paleomagnetic samples from the Visean Caroda Formation of the North Tamworth block and from the previously not studied Emu Creek block located at the eastern flank of the Texas orocline. Our new paleomagnetic results from the North Tamworth block are comparable in age with previously published Visean data from the Manning orocline. The comparison of these results suggests that the North Tamworth terrane has been rotated at $\sim 90^{\circ}$ anticlockwise between 330 and 260 Ma. The new data from the Emu Creek block support the previous model of the movement of the Texas block (Cawood et al., 2011). Here we present the revised animated model of the evolution of the New England Orogen.