

2006 Philadelphia Annual Meeting (22–25 October 2006)

Paper No. 184-14**Presentation Time:** 11:15 AM-11:30 AM**NEOPROTEROZOIC RIFTING IN CENTRAL AUSTRALIA AND THE
BREAKUP OF RODINIA****[GREENE, David C.](#)**, Dept. of Geosciences, Denison University, Granville, OH 43023, greened@denison.edu

During the Neoproterozoic breakup of the supercontinent Rodinia, Australia was rifted away from other elements of Rodinia along a boundary referred to as the Tasman Line. The Tasman Line consists of NE- and NW-trending segments that appear to define a system of rifted margins connected by transform faults. Many recent tectonic models have interpreted NE-trending segments of the Tasman Line as extensional and NW-trending segments as transform boundaries, and have sought to reconstruct Australia's place in Rodinia by matching features with these orientations on other continents (e.g. Laurentia). Others, however, have interpreted NW-trending segments as extensional and NE-trending segments as transform boundaries, implying very different orientations for potentially matching structures on other continents.

New work in the southern Georgina Basin in central Australia focuses on a critical region where NW- and NE-trending segments of the Tasman Line intersect to form a reentrant in the Neoproterozoic continental margin. Field work and geophysical data from the Toko Syncline, Field River Anticline, Jervis Range, and Dulcie Syncline document a system of NW-trending Neoproterozoic rift basins underlying Paleozoic strata. Normal faults bounding these rift basins were selectively reactivated during the mid-Pz Alice Springs Orogeny, and are now expressed as high-angle reverse faults that invert the pre-existing rift basins. These NW-trending rift basins suggest that the adjacent continental margin also formed with rift segments trending NW, consistent with regional gravity and magnetic data that suggest NW-trending extensional basins truncated by NE-trending transform faults.

A rifted margin with this orientation conflicts with reconstructions of Rodinia such as AUSWUS that postulate NW-trending transform faults extending from North America into Australia, and may be more easily accommodated by alternative reconstructions that place continental blocks such as Siberia or South China between Australia and the western edge of North America. The presence of one of these intermediate continental blocks between Australia and Laurentia may help resolve discrepancies between the apparent age of rifting and breakup in Australia (780 Ma) versus western North America (580 Ma).

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