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Coal Accumulation in a High Accommodation Setting—Greta Coal Measures, New South Wales, Australia

The Greta Coal Measures represent a high accommodation end-member of a spectrum of variable accommodation settings that typify non-marine deposits. The Greta Coal Measures are the lower of two main coal-bearing intervals in the Permian northern Sydney Basin, Australia. High quality outcrop and continuous core data are available from the Muswellbrook Anticline area in the Hunter Valley, enabling a sequence stratigraphic interpretation of the Greta Coal Measures. Age and core relationships indicate an unconformity at the base and top of the Greta Coal Measures. A correlation between dated tuffs in the upper Greta Coal Measures in the Muswellbrook area and the Maitland Group in the Cessnock area establishes a clear diachronous upper boundary for the Greta Coal Measures resulting from a northwestward marine transgression. The Greta Coal Measures are interpreted to occupy a single sequence in which lower fluvial and lacustrine Skeletar Formation makes up a transgressive systems tract, the Ayrdal Sandstone Member is an estuarine unit associated with the maximum flooding surface, and the upper fluvial to deltaic Rowan Formation occupies a highstand systems tract. The overlying Jasdec Park Sandstone Member of the Maitland Group infills incised valleys above a sequence boundary and then occurs as a transgressive shoreline system before passing into the glacial marine Branxton Formation. The Greta Coal Measures represent high accommodation where subsidence and sediment supply were approximately balanced over more than 100 m of accumulation, and the development of 14 coal seams occurred in a single sequence.