

The nature of the lithosphere in the vicinity of the Eucla-Gawler reflection seismic line

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The recent and ongoing program of reflection profiling in western and central Australia has provided considerable insight into the nature of crustal architecture. Complementary information on the nature of the whole lithosphere comes from a broad range of seismological studies using both man-made and natural sources. The Eucla-Gawler line crosses a region for which there was little prior information. The reflection line provides important information about the crust-mantle boundary, but for the seismic wave speeds in the crust we are dependent on extrapolation of isolated refraction experiments from before 1980, and a few receiver functions at broad-band stations linked with ambient noise tomography. For the mantle component of the lithosphere the primary information comes from surface wave tomography, supplemented by analysis of Pn mantle refractions. Additional constraints come from the analysis of the large-scale features of magnetic variations for both magnetic character and depth to base of magnetisation. The synthesis of the different classes of information provide indications of distinct lithospheric units along the profile that continue into the mantle.