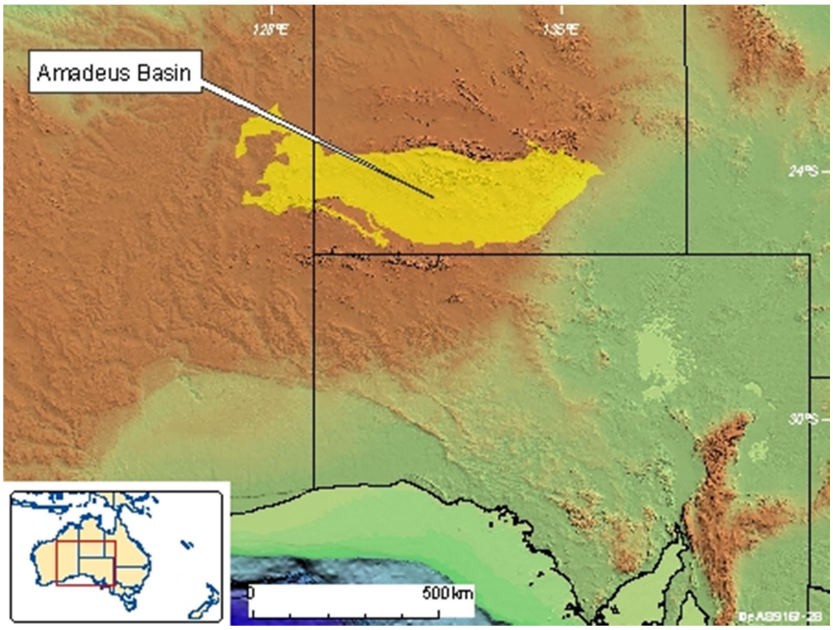
Amadeus Basin



Map showing the location of Amadeus Basin in relation to Australia

Basin Details and Geological Overview

The intracratonic Neoproterozoic to Early Carboniferous Amadeus Basin occupies much of the southern quarter of the Northern Territory and extends about 150km into Western Australia, covering about 170 000km^2 in total. It has a maximum sediment thickness of 14 000m with several major depocentres including the Idirriki, Carmichael and Ooraminna Sub-basins and Missionary Plain Trough along the northern margin and the Mount Currie and Seymour Sub-basins in the south. Early Neoproterozoic volcanics and fluvial siliciclastics in the west form a rift sequence associated with an extensional event caused by the breakup of the Rodinia Supercontinent.

Subsequent thermal relaxation and subsidence initiated widespread marine siliciclastic and carbonate sedimentation associated with extensive evaporites. This marine succession is terminated by an erosional surface which is overlain by fluvial and glacigene sediments associated with the Sturtian and Marinoan glaciations. Subsequent marine siliciclastic and carbonate sedimentation extended into the latest Proterozoic.

Depositional patterns were changed abruptly by the Petermann Ranges Orogeny with extensive uplift along the southwest margin of the basin feeding deposition of widespread fluvial and marine siliciclastics during the latest Proterozoic-Early Cambrian. This was followed by deposition of a succession of marine siliciclastics and carbonates with minor evaporites for most of the remainder of the Cambrian. In the latest Cambrian, the Delamerian Orogeny caused a change to predominantly marine siliciclastic deposition. This continued until the Middle Ordovician when evaporites again appeared.

The final phase of deposition in the basin comprised shallow marine, fluvial and aeolian siliciclastics, which are capped by synorogenic (Alice Springs Orogeny), molasse-type, coarse siliciclastics extending into the Early Carboniferous. Hydrocarbons are currently produced from an Early Ordovician source at Mereenie Oilfield and Palm Valley Gasfield. The Neoproterozoic sourced Dingo Gasfield is currently underdeveloped. Most anticlinal closures in the basin have been tested, but other possible plays such as fault controlled structures and stratigraphic traps have not been drilled.

Key References

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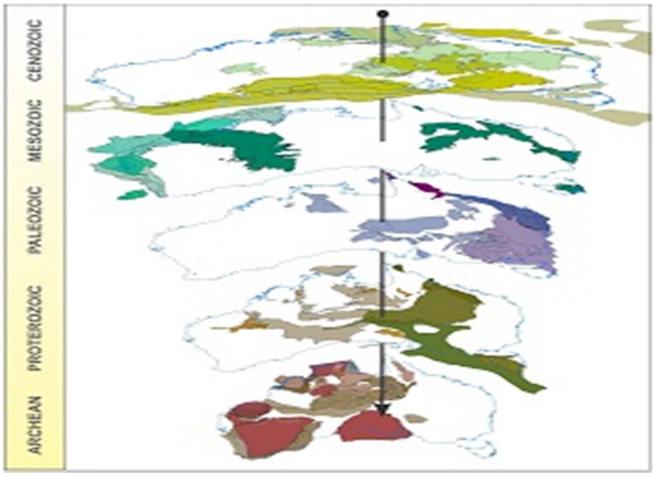

Time slices through Australia's geological provinces

The Australian Geological Provinces Database contains descriptions and spatial extents of the fundamental geological elements of the Australian continent and its offshore surrounds.

Province types include sedimentary basins, tectonic provinces such as cratons and orogens, igneous provinces, and metallogenic or mineral provinces. At its simplest, a province may describe a sedimentary basin and its fill (eg, the Sydney Basin). However, provinces may also be defined by a complex history of tectonics, metamorphism, magmatism, or metallogenesis.

Provinces outlines, including their subsurface extent, are compiled at around 1:1million scale. Descriptions of the provinces include age and geological history, parent-child hierarchy, constituent stratigraphic units, relations to surrounding provinces, and the presence of mineral and petroleum resources.