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West Alberta Arch control on the Precambrian to Triassic Western Canadian Sedimentary Basin and tectono-stratigraphic and mantle/lower crust foundations of the Basin

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Summary

Regional atlas-scale maps (1000 x 1300 km) of sedimentary facies and basinal subsidence (thickness) are used here to portray the tectonic architecture of western parts of the Western Canada Sedimentary Basin. The maps show principal stages during Precambrian to Triassic times over the Alberta and British Columbia portions of the Basin. The maps focus on the Paleozoic to Triassic western continental margins and the western parts of the inboard cratonic platform of western Canada. The maps cover the platform stages before the major Jurassic to Tertiary compressional orogen development.

Plotting stages of Basin development through time on the same base map shows that the Basin's main controlling tectonic elements are several phases of the West Alberta Arch and these elements controlled most depocentre subsidence and depositional facies trends from the Paleozoic to Triassic. Related subsidiary controls include the Macdonald Platform, Peace River–Athabasca Arch and Montania. Northern and southern parts of the West Alberta Arch (respectively the Peace River-Athabasca Arch and Montania) became delinked through time, as central portions of the Arch become inactive or submerged while at other times, the north and south ends of the West Alberta Arch became actively uplifted or emergent.