

## **EARLY CRETACEOUS HIGH LATITUDE MARINE REPTILE ASSEMBLAGES FROM SOUTHERN AUSTRALIA**

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### **ABSTRACT**

The Lower Cretaceous (Aptian-Albian) southern high latitude deposits of Australia have yielded a diverse range of marine reptile fossils. Ichthyosaurs and at least five distinct plesiosaur taxa have been recorded. Most of the current marine reptile specimens are derived from the predominantly Aptian Bulldog Shale and Wallumbilla Formation. These units, famous for producing opal, represent shallow epicontinental marine depositional environments. Fragmentary plesiosaur remains have also been recovered from high latitude non-marine deposits of the Wonthaggi, Eumeralla, and Grimman Creek formations. These are Aptian to middle Albian in age, and comprise fine-grained fluvial/estuarine sediments laid down in inland rift valleys and coastal flood plains near the Cretaceous southern polar circle. Estimates of palaeolatitude place most of southern Australia at around 60° to 80° S during the late Early Cretaceous. Sedimentary structures, fossils, isotope data, and climatic modeling indicate highly seasonal cool-cold conditions possibly with winter freezing. This contrasts markedly with climate regimes typically tolerated by modern aquatic reptiles, but suggests that some Mesozoic forms may have possessed adaptations to cope with low average water temperatures.