A Sequence Stratigraphic approach to interpreting the $\delta^{13}C$ record using an Early Cambrian Carbonate Platform

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TITLE

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RUNNING TITLE

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ABSTRACT

The Early Cambrian Wilkawillina Platform displays a continuous platform to basin facies that enables physical time surfaces to be used to compare roughly synchronous $\delta^{13}C$ values of carbonates to test their lateral variation in range. The two sections measured showed a progression from shallow water deposition of the Woodendinna Dolomite to deeper water deposition of the Oraparinna Shale in the basin while biostromes of Archaeocyatha developed on the shelf. Using a sequence stratigraphic approach, the sections were correlated using the time significant sequence boundaries shared between the two sections. Correlated by the sequence boundaries, stable isotopes ($\delta^{13}C$ and $\delta^{18}O$) were then compared and found to be out of phase with each other. A chronostratigraphic diagram shows that carbonate deposition is not continuous over time and therefore, the $\delta^{13}C$ record is episodic. This approach emphasises the punctuated nature of the record and the predominance of depositional hiatus in sections, while previous chemostratigraphic studies have assumed the $\delta^{13}C$ record to be largely continuous through time when making correlations.

KEYWORDS

Sequence Stratigraphy, $\delta^{13}C$ record, carbonate platforms, Wilkawillina Platform, Early Cambrian, stratigraphic correlation, chemostratigraphy.

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