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## **The Building Block of Non-Tropical Periplatform Carbonates: New Insights from Southern Australia**

The Eucla Shelf off South Australia is a 200 km wide non-tropical carbonate depositional system. It comprises a Pleistocene sedimentary wedge with a set of prograding clinoforms. ODP Site 1127 is located on the upper shelf slope and intersects the distal part of this wedge. The Pleistocene periplatform succession is dominated by bioclastic packstones and wackestones with minor intercalations of bioclastic grainstones. Analyses of variations in grain size, carbonate mineralogy, oxygen isotopes, organic carbon and carbonate carbon isotopes, as well as point counting of thin sections were carried out for a chosen Early to Middle Pleistocene interval. A sea level curve for this part of the succession was reconstructed using a combination of the oxygen and organic carbon isotope signals. A 40 ka sedimentary cyclicity triggered by sea level changes and changes in palaeoproductivity is reflected in lithological, compositional, and mineralogical variations, as well as in the gamma ray and Formation Microscanner downhole logs. Cycles are approximately 10 m thick coarsening upward bundles. Lowstand deposits are finer grained than highstand deposits. Components derived from different shelf environments, such as tunicate spicules, brownish bioclasts, and coralline debris are preferentially shed to the slope during sea level rises and highstands. This also applies for bryozoan debris. Sponge spicules and high amounts of micrite dominate during sea level lowerings and lowstands. Aragonite and high-Mg calcite are mainly concentrated in sediments deposited during sea level rises and highstands, whereas concentrations of dolomite are highest in sediments deposited during incipient sea level rises.