

## **Using remnants of the last interglacial shoreline to inform Holocene coastal evolution in the tectonically subsiding River Murray Estuary of southern Australia**

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Tectonic controls in confluence with antecedent morphology dictate site-specific, long-standing imprints on coastal evolution. The depth of older strata, their integrity and resistance to erosion, influence modern shoreface development and morphology. During a sea-level transgression, the extent of erosion that occurs is a function of ongoing sediment availability. The River Murray Estuary has been designated a failed delta due to lack of sediment supply via the modern river implying extensive erosion of the previous highstand system to generate the modern barrier coastline. This work utilized extensive literature review, field mapping, sediment analyses, and multiple geochronological methods to establish the relationship between the last interglacial shoreline and Holocene sediments. From this, inferences are made regarding not only the establishment and development of the modern coastline, but also the erosional history of the last interglacial deposits during the intervening period of lowered sea level. Conclusions are based upon our understanding of the behavior of transgressive barrier shorelines on low-gradient coastal plains, localised coastal processes, and the inherited geological framework. The modern barrier sediments are derived not only from the extensive reworking of the last interglacial shoreline but sediments deposited locally and on the now off shore shelf during lowered sea level. Preservation potential is also decreased by the slow rate of subsidence in the region, which does not produce adequate accommodation space on this high-energy coastline, subjecting antecedent features to extensive erosion via not only the river, but also waves.