ANZGG Conference 2024

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***What's going on within the coastal plain around the Gulf of Carpentaria?***

The coastline of the Gulf of Carpentaria in northern Australia extends for ~1900 km from Bamaga in Cape York to Nhulunbuy in the Northern Territory. The Holocene coastal plain around the Gulf coast is extremely low lying, extending in parts some 30km inland, at which point it may have only achieved a maximum elevation of 1-2m above MSL. This landscape represents some of the lowest lying coastline in Australia and as such is likely to show early signs of climate change impacts. A recent reconnaissance survey demonstrates that that the entire coastal landscape has undergone profound changes over the last 50 years, and particularly the last two decades. Coastal erosion in some parts of the Gulf coast are occurring at rates of >5m per year, whilst in other areas progradation is occurring at rates of >5m per year. Local variations are a function of the riverine inputs and the clockwise gulf gyre that represents the dominate current around the Gulf. In addition to the coastal erosion, other changes includes the development of entire estuary systems, and the landward extension and expansion of tidal estuaries, coupled with a major expansion in the extent of mangroves. The widely documented mangrove dieback event that occurred in 2015, represents a fairly minor deviation from the longer term trend. Accompanying the landward tidal channel expansion, is the extensive erosion of the coastal plain through a process that is akin to low gully scarp retreat. Indeed, the further inland the tidal channels extend, the scarps increase in scale to the point where it becomes a classical alluvial gullying process. In this talk, I will propose several hypotheses as to what is driving this complex interplay of erosion processes.