Exploring Modern Analogues in a Late Quaternary Low-Angle Fan-Delta Complex, Lake George, NSW

**Jones, Alysha1**, Pillans, Bradley1, Opdyke, Bradley1

1Australian National University, Canberra, ACT 2601, Australia

# ABSTRACT

The Lake George Basin, NSW, boasts an exceptional sedimentary record spanning nearly 4 million years, unrivalled by any other terrestrial depositional system in Australia. Historical data reveals the lake’s dynamic history, with water levels fluctuating between 0 and 7 metres deep since 1820 (Short et al. 2021). Paleoshorelines occur more than 30 metres above the current lake floor, and at a depth of 37 meters, the lake would overflow westwards through Gearys Gap into the Murrumbidgee River system.

Within the basin, the largest catchment, Butmaroo Creek, converges with the lake from the southeast, giving rise to a gently sloping fan-delta complex. Exposures along the lower reaches of Butmaroo Creek and in the nearby Bungendore Sands Quarry offer unique insights into the relatively unexplored sedimentation and architecture of humid fan systems. This depositional system includes point-bar deposits, overbank sediments, aeolian and beach deposits, occasionally featuring clay drapes. Chronology is provided by a combination of OSL and radiocarbon dating.

A comprehensive facies model, based on sedimentary features, facilitates comparison between ‘modern’ analogues in Butmaroo Creek and the older Bungendore Sands outcrops. For example, finer-grained sediment forms silt or clay drapes infilling the surface topography of ripples within the channel of Butmaroo Creek. Rarely observed in an ephemeral stream setting (e.g., Martin, 2000), silt and clay drapes reminiscent of flaser bedding are observed in Late Pleistocene exposures within the quarry.

This study thus offers a unique opportunity to use modern analogues from a nearby fluvial environment to aid in uncovering a Late Quaternary sedimentary record of a low-angle fan-delta system.

# REFERENCES

Martin, A. J. (2000). Flaser and wavy bedding in ephemeral streams: a modern and an ancient example. *Sedimentary Geology*, *136*(1-2), 1-5.

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