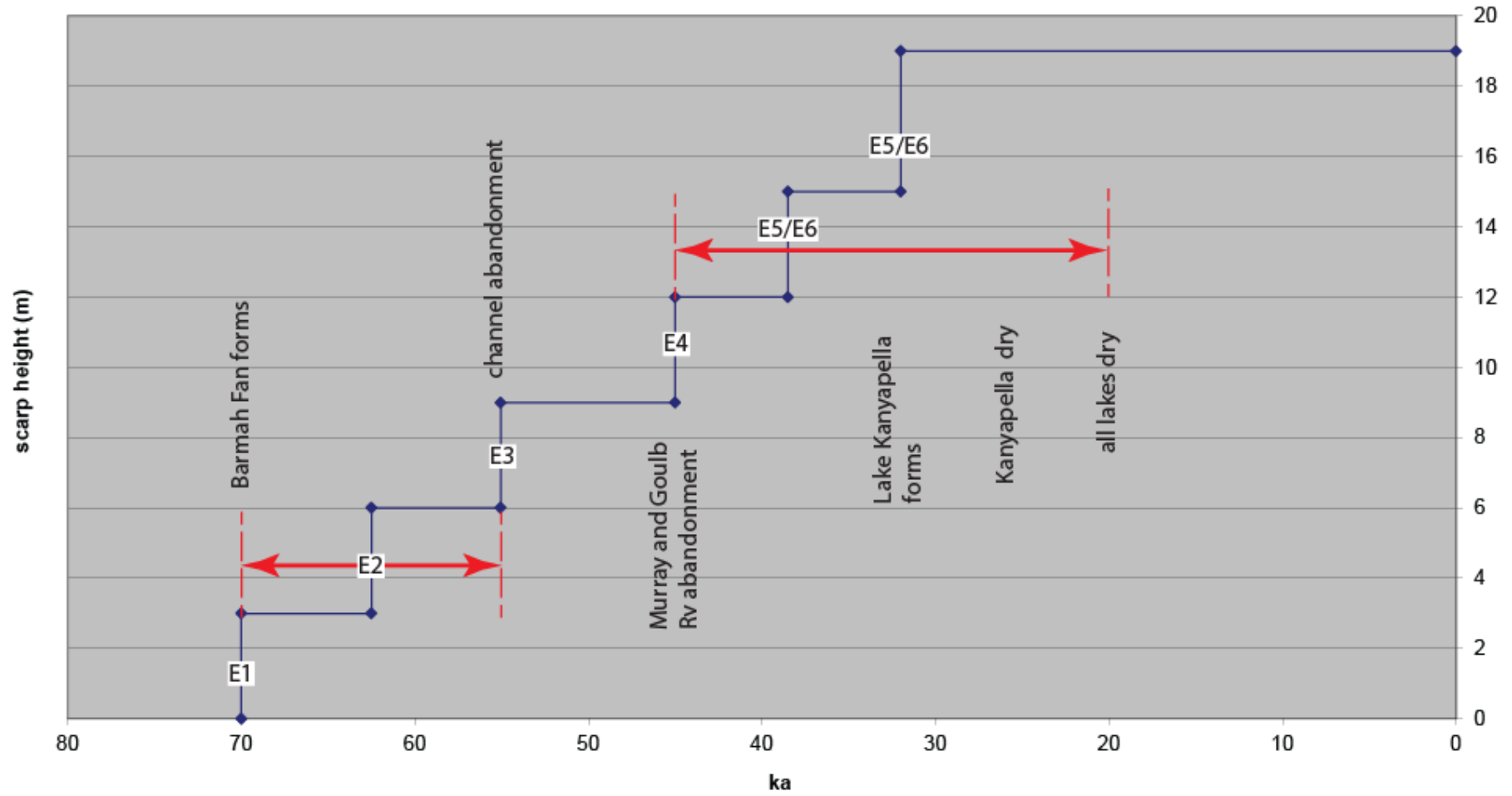


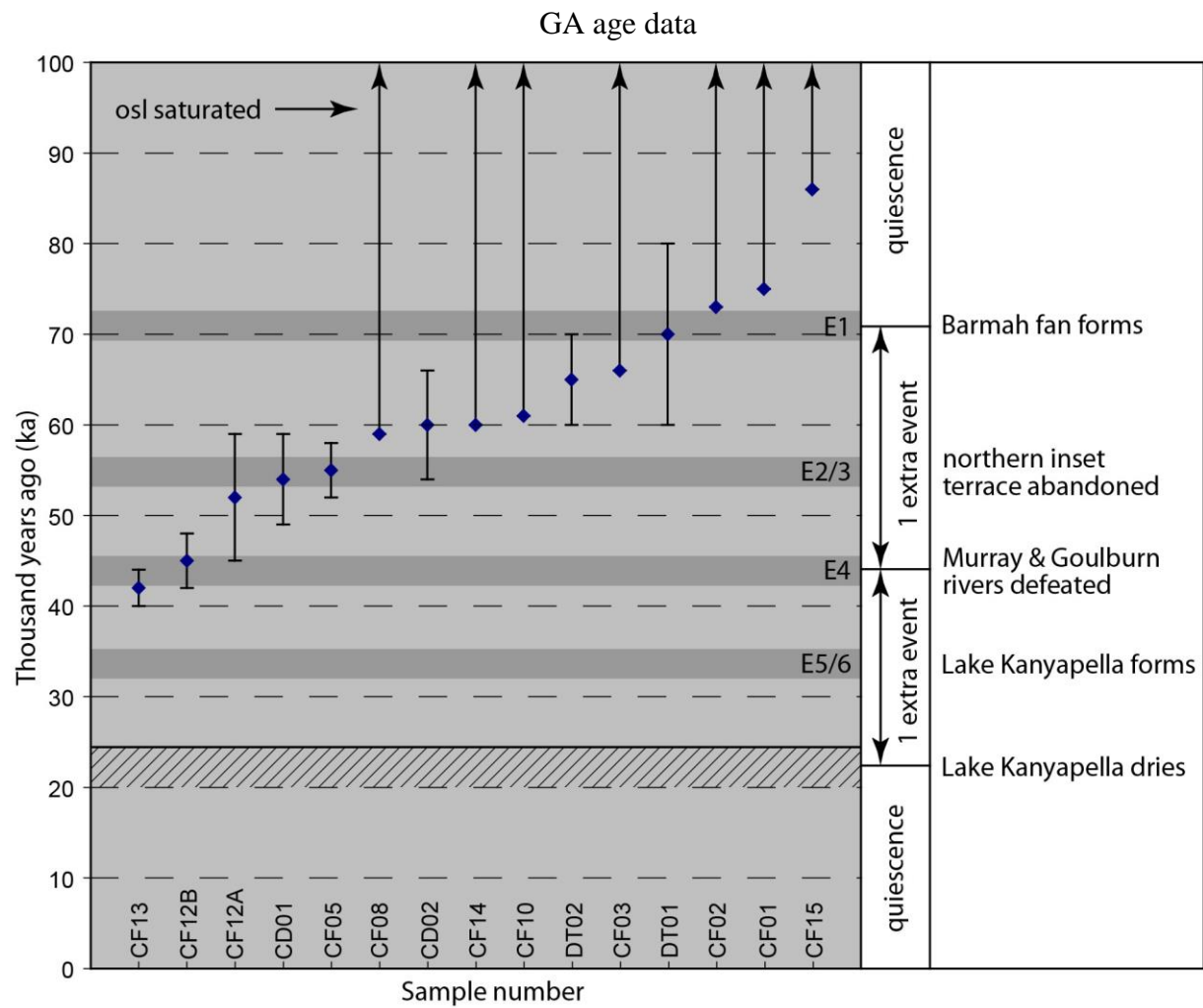
Notes and interpretation of geochronological data constraining the timing of seismic events on the Cadell fault. See also Clark et al (2015).

- DT01 and DT02 bracket a seismic event at 60-80 ka (**E1**). The upper terrace of the northern paired terraces was abandoned $\geq 61-66$ ka (CF03, CF10) and the channel displaced by the NW trending scarp segment was abandoned $\geq 73-75$ ka (CF01, CF02), possibly during the same event. The age of abandonment of the upper inset terrace in Green Gully has not been constrained, but likely also relates to this event.
- Sandy channel material was being deposited south of Green Gully from *ca.* 80-49 ka (CD01, CD02, DT02, DT01). This indicates that the initial seismic event did not cause the floodplain to be abandoned in the south. In the north, the lower terrace of the paired terraces was still occupied until 55 ± 3 ka (CF05).
- The active channel of the lower of the two terraces at the northern paired terrace locality had been occupied since at least 59 ka (CF08), and was abandoned after 55 ± 3 ka (CF05). Channel sands in Green Gully relating to the T3 terrace level, dated at 52 ± 7 ka (CF12A), suggest that this northern abandonment event relates to a third seismic event (**E3**). Ages in the range of 55-70 ka for the undated T2 terrace within Green Gully would support the postulate of an **E2** event.
- The Murray River channel (at Green Gully) and the Goulburn River channel (at Dora Banks) were abandoned simultaneously (within error) after 40 - 48 ka (CF12B, CF13), most plausibly as the result of a further seismic event (**E4**). Fluvial activity on the hangingwall block ceased at this time.
- The lower terrace within Green Gully occurs approximately 10 m above the current floodplain level. At least a further two large seismic events subsequent to **E4** (assume 3-4 m of uplift) are required account for this relief (**E5**, **E6**), assuming no fill on the floodplain (this is supported by the absence of fill material in the Dora Banks trench).
- From Clark et al (2015): textural variation from lake floor to dune, and the presence of coarse sandy beaches preserved within the dune, demonstrate the origin of the lunette on the eastern margin of the tectonically dammed Lake Kanyapella by deflation from wave nourished beaches (Bowler 1978) (Figs 4b & 5a). An age for the timing of the establishment of the maximum extent of the lake is provided by an age of 32.4 ± 2.2 ka on the basal sediments of the lunette from Fitts Quarry (Stone 2006b). The filling of Lake Kanyapella to its maximum level potentially dates a seismic event at *ca.* 32 ka (**E5** or **E6?**).
- The drying of the lake is constrained by the depositional age of the upper Kanyapella lacustrine silt unit at 24.7 ± 1.5 ka (Stone 2006b) and the formation of a lunette relating to the smaller lake Little Kanyapella (Bowler 1978) on the dry Lake Kanyapella floor at 18.9 ± 1.1 ka (Stone 2006b). No seismic event appears to have subsequently deformed the dry lake floors (Fig. 4b).
- Given that a large seismic event subsequent to the 32 ka impounding of Lake Kanyapella might have reinforced the lake barrier, reducing the likelihood of the

Goulburn River overtopping and breaking through, it is preferred that the lake impounding event was the last in the sequence (**E6**), and an **E5** event occurred in the interval 32-45 ka. This postulate is not well supported by dating. The last event might indeed have occurred in the interval 32-20 Ka.

Displacement history Cadell





Sample	Depth (m)	Context	Optical age (ka)
CD01	1.8	Sandy channel/floodplain material (Dora Banks)	54 ± 5
CD02	2.3	Sandy channel material (Dora Banks)	60 ± 6
CF01	1.4	Abandoned silty channel on NW trending scarp segment	>75
CF02	1.1	Abandoned silty channel on NW trending scarp segment	>73
CF03	1.5	Upper terrace of northern paired terraces	>66
CF05	1.3	Channel of northern paired terraces	55 ± 3
CF08	1.7	Lower terrace of northern paired terraces	>59
CF10	0.9	Upper terrace of northern paired terraces	>61
CF12A	2.4	Green Gully palaeochannel	52 ± 7
CF12B	1.8	Green Gully palaeochannel	45 ± 3
CF13	2.0	Goulburn River palaeochannel	42 ± 2
CF14	1.4	Lower surface at relay ramp locality	>60
CF15	1.4	Upper surface at relay ramp locality	>86
DT01	2.7	Channel sand cut by fault (Dora Banks)	70 ± 10
DT02	1.4	Channel sand uncut by fault (Dora Banks)	65 ± 5