fire

Supplementary Material

Details of sites of charcoal records from the mainland and Tasmania

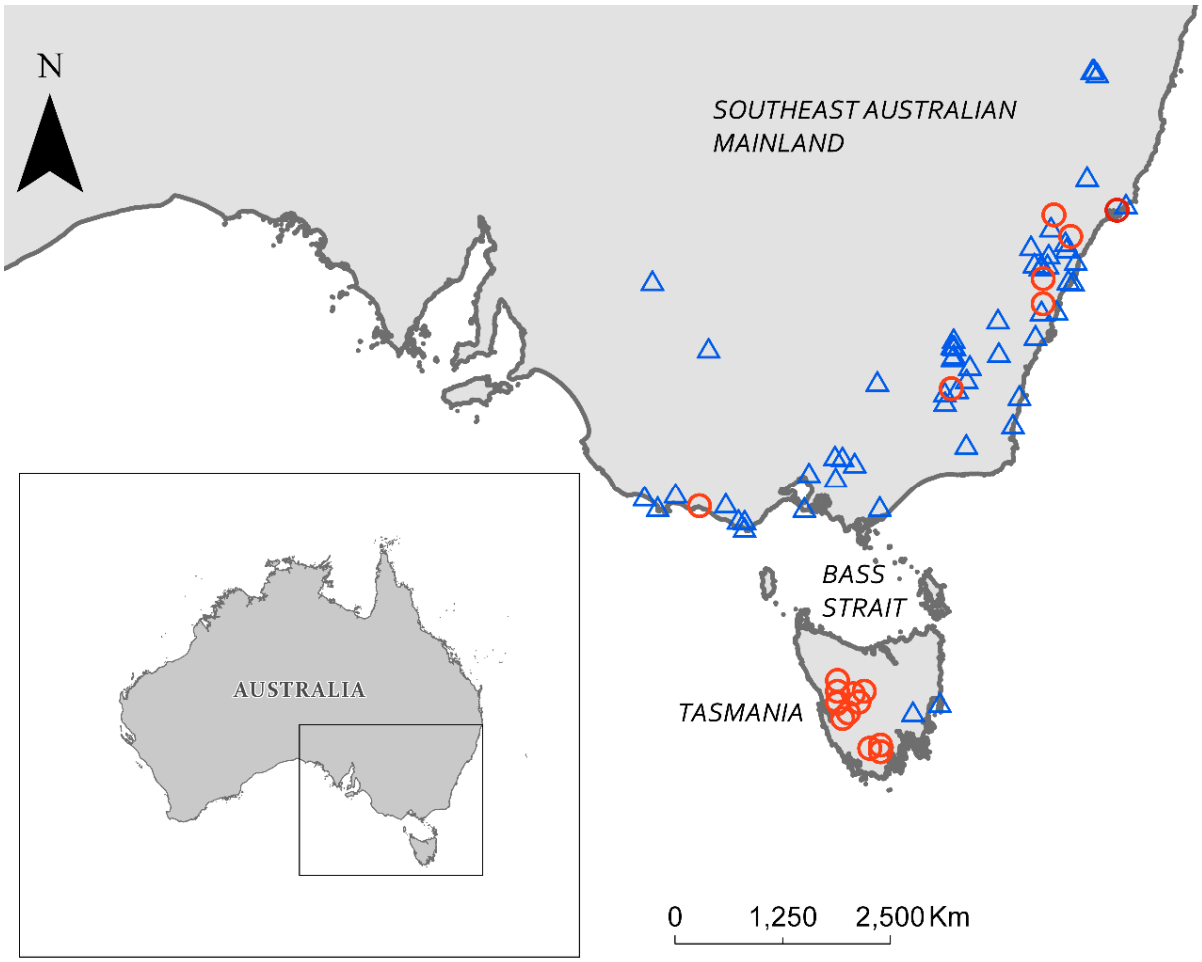

Figure 1. Sites of macroscopic (red circles) and microscopic (blue triangles) charcoal records from the mainland (55 sites) and Tasmania (16 sites). Fourteen of out of the 16 records from Tasmania are macroscopic charcoal records, while the remaining two sites from eastern Tasmania are microscopic charcoal records (<125 μm). For the southeast mainland, all charcoal records were extracted from the Global Paleofire Database, and records selected had at least one radiocarbon dates every 2500 years. Seven out of the 55 records from the southeast mainland are macroscopic charcoal records, while the remaining 48 are microscopic charcoal records (see Table S1 for details). Microscopic charcoal records were considered due to the limited availability of macroscopic charcoal records in eastern Tasmania and the southeast mainland. Although, macroscopic and microscopic charcoal records are usually used to infer local and regional fire signal, respectively (Whitlock and Larsen, 2001); however, composite analysis of multiple macroscopic and/or microscopic charcoal has proven to be effective in past regional biomass burned reconstruction [Mooney et al., 2011]. Also, only macroscopic charcoal records were selected for recurrence-rate-of-fire-episodes reconstruction.

Table 1. Site information for charcoal records (mostly >125 μm) from western Tasmania (W.Tas), eastern Tasmania (E.Tas), and southeast mainland (SEM). Numbers in bracket in SEM sites are site identification numbers in the Global Paleofire Database. Other 47 sites included for SEM are microscopic charcoal (<125 μm) and can be assessed in the Global Paleofire Database (https://www.paleofire.org/) using the setting 'lat>-39, lat<(-28), long>140, long<154, date_int<=2500' in the 'paleofire' package in 'R'.

Site name	Latitude	Longitude	Elevation	Region	Source
Basin	-41.98082°	145.5483°	577	W.Tas	Mariani and Fletcher (2017)
Gaye	-41.82642°	145.6033°	892	W.Tas	Mariani and Fletcher (2017)
Gwendolyn	-42.26238°	145.8231°	923	W.Tas	Mariani and Fletcher (2017)
Nancy	-42.25877°	145.8271°	1037	W.Tas	Mariani and Fletcher (2017)
Vera	-42.27459°	145.8799°	571	W.Tas	Mariani and Fletcher (2017)
Osborne	-43.21621°	146.7593°	920	W.Tas	Mariani and Fletcher (2017)
Julia	-41.88923°	145.5761°	616	W.Tas	Mariani and Fletcher (2017)
Square tarn	-43.21431°	146.5942°	865	W.Tas	Mariani and Fletcher (2017)
Hartz	-43.23809°	146.7566°	952	W.Tas	Mariani and Fletcher (2017)
Selina	-41.87772°	145.6094°	516	W.Tas	Mariani and Fletcher (2017)
Owen tarn	-42.09961°	145.6094°	969	W.Tas	Mariani and Fletcher (2017)
Isla	-41.97053°	145.6654°	720	W.Tas	Mariani and Fletcher (2017)
Rolleston	-41.92149°	145.6248°	650	W.Tas	Mariani and Fletcher (2017)
St. Clair	-42.1°	146.1667°	825	W.Tas	Hopf et al. (2000)
Stoney*	-42.35°	147.6°	394	E.Tas	Jones et al. (2017)
Hazard*	-42.17222°	148.2892°	1.8	E.Tas	Mackenzie and Moss (2017)
Nwctw (215)	-38.31°	142.36°	20	SEM	D'Costa et al. (1989)
Blue (631)	-36.14°	148.43°	1950	SEM	Raine (1974)
Grey pole (632)	-32.61°	152.31°	9	SEM	Horn (2005)
Griffith (633)	-33.28°	151°	20	SEM	Mooney et al. (2007)
Howes (635)	-33.01°	150.66°	280	SEM	Mason (2004)
Baraba (216)	-34.23°	150.53°	305	SEM	Black et al. (2006)
Kings (637)	-33.01°	150.66°	280	SEM	Black (2001)
Wingecarribee (729)	-34.56°	150.51°	685	SEM	de Montford (2008)

*microscopic charcoal (<125 μm).

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AMS dates and age-depth model of unpublished sites on the Furneaux Group islands, Bass Strait.

Table 2. AMS radiocarbon dates for Apple Orchard Lagoon, Bumpy Lagoon, Tobacco Lagoon, and Piano Point Lagoon, measured at 'DirectAMS', Washington.

Site	Lab ID	^{14}C yr BP	Error (1σ)	Depth cm
Apple Orchard Lagoon	D-AMS 036727	2207	35	21
Apple Orchard Lagoon	D-AMS 036728	5819	33	43
Apple Orchard Lagoon	D-AMS 036729	6292	30	65
Apple Orchard Lagoon	D-AMS 036730	6991	32	85
Bumpy Lagoon	D-AMS 026692	486	25	18
Bumpy Lagoon	D-AMS 032457	2702	29	28
Bumpy Lagoon	D-AMS 032458	3396	25	36
Bumpy Lagoon	D-AMS 026693	3584	40	44
Tobacco Lagoon	D-AMS 036733	576	37	15
Tobacco Lagoon	D-AMS 036734	3004	37	41
Piano Point Lagoon	D-AMS 036735	982	25	15

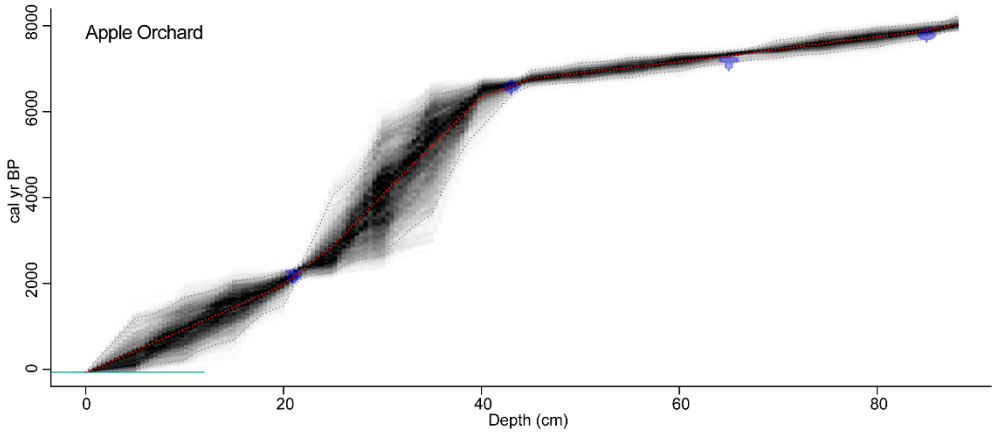

Figure 2. Age-depth model (Bacon) for Apple Orchard Lagoon, showing calibrated ^{14}C dates (purple), age-depth model (dark shaded grey), 95% confidence intervals of calibrated range (light shaded grey), and single 'best' model based on the weighted mean age for each depth (red curve). Cal yr BP is calendar year before present.

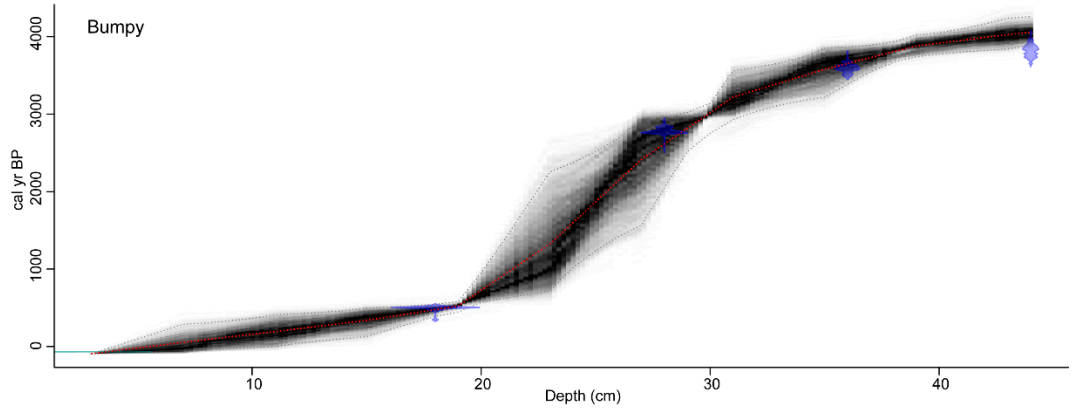

Figure 3. Age-depth model (Bacon) for Bumpy Lagoon, showing calibrated ^{14}C dates (purple), age-depth model (dark shaded grey), 95% confidence intervals of calibrated range (light shaded grey), and single 'best' model based on the weighted mean age for each depth (red curve).

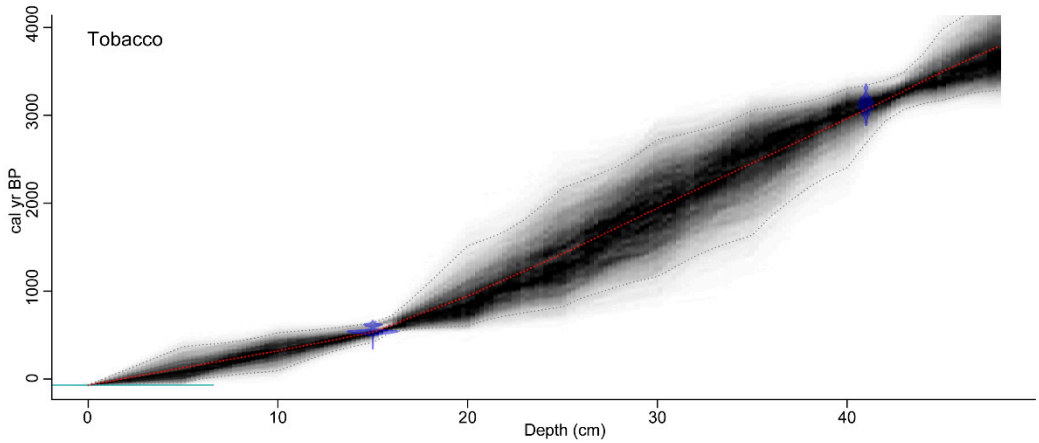

Figure 4. Age-depth model (Bacon) for Tobacco Lagoon, showing calibrated ^{14}C dates (purple), age-depth model (dark shaded grey), 95% confidence intervals of calibrated range (light shaded grey), and single 'best' model based on the weighted mean age for each depth (red curve).

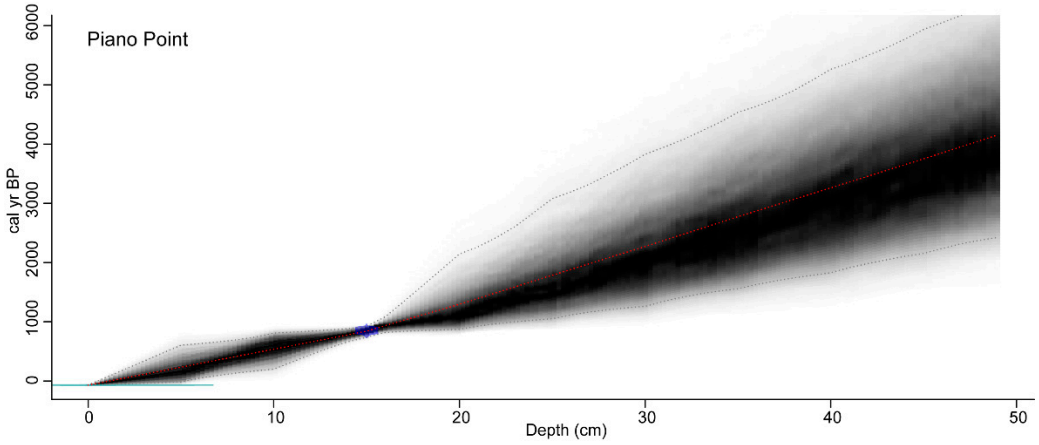

Figure 5. Age-depth model (Bacon) for Piano Point Lagoon, showing calibrated ^{14}C dates (purple), age-depth model (dark shaded grey), 95% confidence intervals of calibrated range (light shaded grey), and single 'best' model based on the weighted mean age for each depth (red curve).

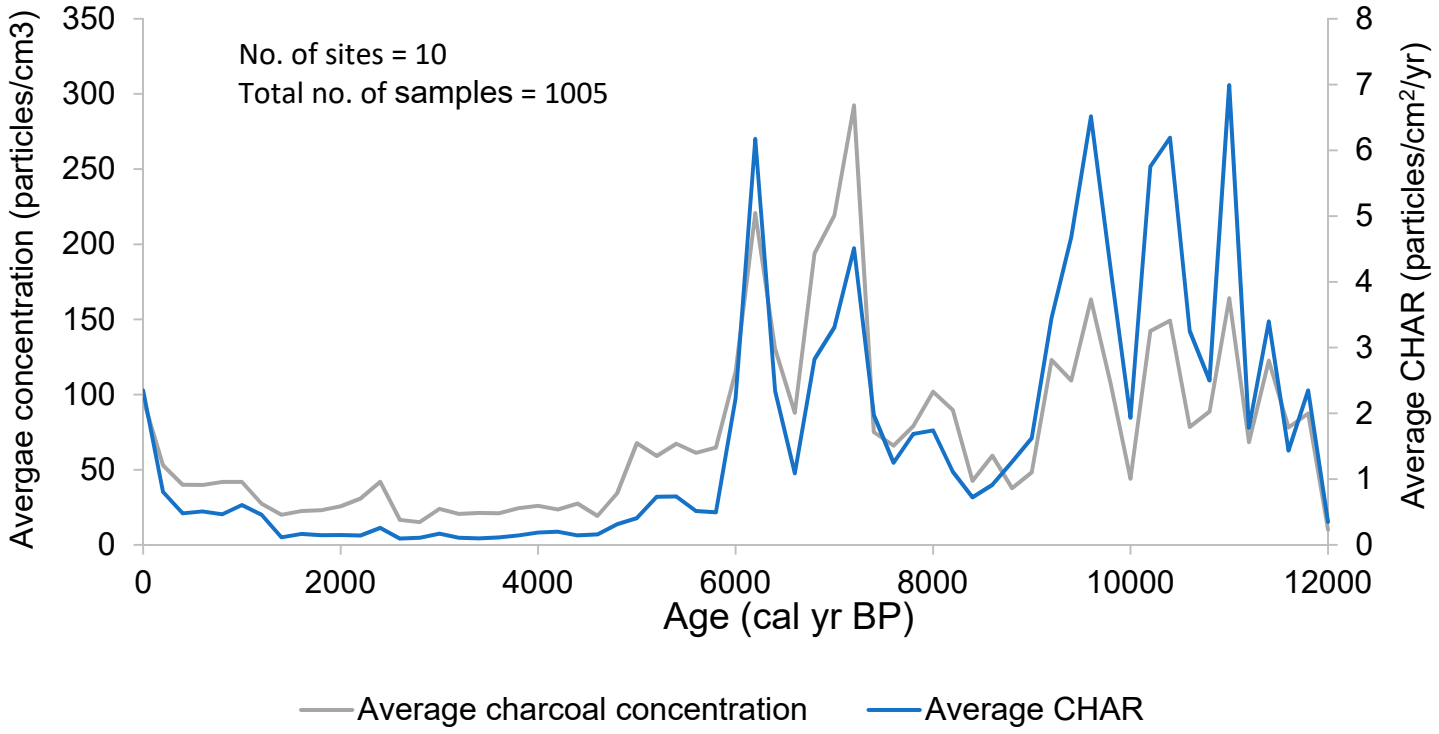

Figure 6. Average charcoal concentration and charcoal accumulation rates (CHAR) for the Furneaux Group Islands during the Holocene.

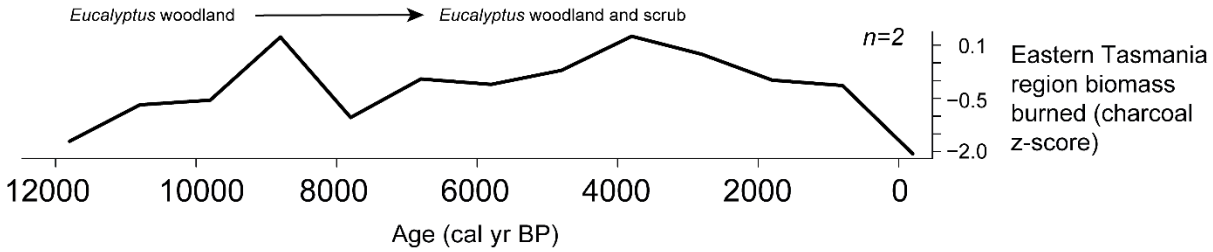

Figure 7. Regional biomass burned (charcoal z-score) for western Tasmania.