

Depth to water table correction for initial carbon-14 activities in groundwater mean residence time estimation

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10 Supporting information

This document contains three data tables (Tables S1, S2 and S3) and one figure (Fig. S1). Tables S1 includes collated unsaturated zone carbon-14 data ($^{14}\text{C}_{\text{uz}}$) from 13 studies. Table S2 includes collated groundwater ^{14}C data ($^{14}\text{C}_{\text{gw}}$) from the Limestone Coast region of South Australia and the Overs/ Goulburn-Broken catchments in Victoria, Australia. Table S3 includes calculated Mean Residence Times (MRTs) of groundwater using the Eqs.

15 1-4 of the main document. Fig. S1 shows time series of atmospheric activities of ^{14}C and tritium (^3H).

Table S1: Unsaturated zone Carbon-14 ($^{14}\text{C}_{\text{uz}}$) activities.

Sample ID	location	Depth (mbg)	$^{14}\text{C}_{\text{uz}}$ (pmC)	$^{14}\text{C}_{\text{uz}}$ error (\pm pmC)	$\delta^{13}\text{C}$ (‰)	Sample Year	Reason if sample was excluded from data fitting process (Eqs. 2-4)
Bacon and Keller (1998)							
-		0.2	72.90	-	-23.90	1994	Organic matter present
-		0.7	27.30	-	-25.00	1994	Organic matter present
-		1.2	3.70	-	-25.70	1994	Organic matter present
-		1.5	5.20	-	-25.80	1994	Organic matter present
-		2.0	6.10	-	-25.70	1994	Organic matter present
-		3.1	2.20	-	-26.00	1994	Organic matter present
-		4.1	1.60	-	-26.00	1994	Organic matter present
-		4.9	1.40	-	-25.90	1994	Organic matter present
-		5.6	1.60	-	-26.20	1994	Organic matter present
-		6.4	2.30	-	-25.80	1994	Organic matter present
-		7.1	2.60	-	-25.50	1994	Organic matter present
Carmi et al. (2009)							
5166.3		2.5	32.60	0.50	-10.00	2005	Organic matter present
5168.3		6.0	31.70	0.20	-10.00	2005	Organic matter present
5159.3		4.5	16.90	0.20	-7.70	2005	Organic matter present
4964.3		6.8	14.80	0.20	-10.40	2005	Organic matter present
5169.3		7.5	8.80	0.10	-11.70	2005	Organic matter present

4963	10.5	6.60	0.10	-11.80	2005	Organic matter present
6028	12.0	1.50	0.10	-11.50	2005	Organic matter present
5144.3	13.5	2.60	0.10	-10.40	2005	Organic matter present
Fritz et al. (1978)						
Station 1	1.0	130.00	3.00	-21.00	1975	-
Station 1	1.0	137.00	9.00	-21.00	1975	-
Station 1	1.0	141.00	10.00	-21.00	1975	-
Station 7	1.0	136.00	7.00	-23.40	1975	-
Station 7	1.0	126.00	14.00	-23.40	1975	-
Piezometer 19-17	7.3	142.00	8.00	-21.10	1975	-
Gillon et al. (2009)						
FS-1	3.0	109.00	1.00	-25.50	2004	-
FS-1	4.5	109.00	1.00	-25.00	2004	-
FS-1	3.0	110.00	1.00	-25.50	2004	-
FS-1	4.5	112.00	1.00	-25.00	2004	-
FS-2	1.2	111.00	1.00	-24.60	2006	-
AS	0.8	90.00	1.00	-15.70	2006	-
AS	4.8	95.00	1.00	-13.80	2006	-
AS	7.8	85.00	1.00	-13.20	2006	-
AS	10.8	83.00	1.00	-12.90	2006	-
AS	15.8	80.00	1.00	-13.80	2006	-
AS	2.3	84.00	1.00	-13.90	2005	-
AS	7.8	84.00	1.00	-13.80	2005	-
AS	10.8	84.00	1.00	-13.80	2005	-
AS	12.8	84.00	1.00	-13.40	2005	-
AS	19.8	82.00	1.00	-13.80	2005	-
AS	22.8	83.00	1.00	-14.20	2005	-
AS	0.8	106.00	1.00	-14.20	2006	-
AS	2.3	99.00	1.00	-15.20	2006	-
AS	4.8	95.00	1.00	-14.40	2006	-
AS	7.8	78.00	1.00	-13.60	2006	-
AS	10.8	77.00	1.00	-13.50	2006	-
AS	15.8	76.00	1.00	-15.20	2006	-
AS	22.8	76.00	1.00	-13.00	2006	-
Haas et al. (1983)						
No. 4	9.1	1.75	-	-	1979	Organic matter present
No. 4	9.1	1.43	-	-	1980	Organic matter present
No. 4	9.1	2.35	-	-	1980	Organic matter present
No. 4	9.1	2.72	-	-	1981	Organic matter present
No. 4	9.1	2.22	-	-	1981	Organic matter present

No. 4	9.1	1.81	-	-	1981	Organic matter present
No. 4	12.8	2.09	-	-	1979	Organic matter present
No. 4	12.8	2.08	-	-	1980	Organic matter present
No. 4	12.8	2.32	-	-	1980	Organic matter present
No. 4	12.8	2.82	-	-	1981	Organic matter present
No. 4	12.8	2.40	-	-	1981	Organic matter present
No. 1	3.0	3.21	-	-	1981	Organic matter present
No. 1	3.0	2.99	-	-	1981	Organic matter present
No. 1	3.0	5.46	-	-	1981	Organic matter present
No. 1	5.2	6.03	-	-	1981	Organic matter present
No. 1	10.9	1.85	-	-	1980	Organic matter present
No. 1	10.9	1.81	-	-	1980	Organic matter present
No. 1	10.9	2.06	-	-	1981	Organic matter present
No. 1	10.9	1.57	-	-	1981	Organic matter present
No. 1	10.9	1.45	-	-	1981	Organic matter present
No. 6	3.0	114.16	-	-	1979	-
No. 6	3.0	113.26	-	-	1980	-
No. 6	3.0	112.79	-	-	1980	-
No. 6	3.0	112.18	-	-	1981	-
No. 6	3.0	112.52	-	-	1981	-
No. 6	3.0	112.33	-	-	1981	-
No. 6	5.8	90.90	-	-	1979	-
No. 6	5.8	86.24	-	-	1980	-
No. 6	5.8	86.29	-	-	1980	-
No. 6	5.8	86.02	-	-	1981	-
No. 6	5.8	85.47	-	-	1981	-
No. 6	5.8	86.84	-	-	1981	-
No. 6	8.5	51.16	-	-	1979	-
No. 6	8.5	53.07	-	-	1980	-
No. 6	8.5	51.28	-	-	1980	-
No. 6	8.5	52.45	-	-	1981	-
No. 6	8.5	52.30	-	-	1981	-
No. 6	8.5	52.96	-	-	1981	-
No. 4	2.7	103.00	-	-	1979	-
No. 4	2.7	95.13	-	-	1980	-
No. 4	2.7	83.72	-	-	1980	-
No. 4	2.7	81.52	-	-	1981	-
No. 4	2.7	87.38	-	-	1981	-
No. 4	2.7	91.70	-	-	1981	-
No. 4	5.8	10.00	-	-	1979	Organic matter present

No. 4	5.8	10.92	-	-	1980	Organic matter present
No. 4	5.8	8.79	-	-	1980	Organic matter present
No. 4	5.8	8.82	-	-	1981	Organic matter present
No. 4	5.8	9.29	-	-	1981	Organic matter present
No. 4	5.8	10.71	-	-	1981	Organic matter present
No. 1	13.7	20.35	-	-	1980	Organic matter present
No. 1	13.7	9.04	-	-	1980	Organic matter present
No. 1	13.7	3.65	-	-	1981	Organic matter present
No. 1	13.7	3.12	-	-	1981	Organic matter present
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Kukler (1969)						
TA-52-22	85.9	101.0	-	-18.5	1967	Samples influenced by modern gas
TA-52-23	24.6	115.0	-	-17.9	1967	Samples influenced by modern gas
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Leaney and Allison (1986)						
-	5.0	84.86	-	-	1984	Deep rooted vegetation
-	16.2	95.59	-	-	1984	Deep rooted vegetation
-	24.1	95.63	-	-	1984	Deep rooted vegetation
-	34.5	93.86	-	-	1984	Deep rooted vegetation
-	15.1	94.41	-	-	1984	Deep rooted vegetation
-	25.3	93.26	-	-	1984	Deep rooted vegetation
-	34.2	90.15	-	-	1984	Deep rooted vegetation
-	38.3	90.28	-	-	1984	Deep rooted vegetation
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Reardon et al. (1980)						
-	5.0	110.00	-	-	1980	-
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Thornstenson et al. (1983)						
Lamb Site #5	5.8	113.1	-	-20.6	1979	-
Lamb Site #4	11.0	111.5	-	-22.9	1979	-
Lamb Site #3	17.1	108.4	-	-18.7	1979	-
Lamb Site #2	21.4	108.6	-	-21.2	1979	-
Glenn Site #6	7.0	91.2	-	-16.03	1979	-
Glenn Site #5	13.4	62.9	-	-25.3	1979	-
Glenn Site #4	19.8	60.2	-	-17.3	1979	-
Glenn Site #3	25.3	63.7	-	-23.1	1979	-
Glenn Site #2	36.3	62.5	-	-27.7	1979	-
Glenn Site #1	44.5	56.2	-	-25.9	1979	-
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Thornstenson et al. (1998)						
-	0.3	113.10	-	-17.45	1992	-
-	1.0	114.30	-	-12.85	1992	-
-	2.1	108.60	-	-18.54	1992	-
-	2.7	110.30	-	-17.52	1992	-
-	8.2	98.70	-	-15.75	1992	-

-	10.1	95.20	-	-15.66	1992	-
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Walvoord et al. (2005)						
-	0.2	113.49	-	-	1992	-
-	0.8	115.19	-	-	1992	-
-	1.8	109.22	-	-	1992	-
-	2.3	110.92	-	-	1992	-
-	7.6	99.27	-	-	1992	-
-	9.9	98.41	-	-	1992	-
-	9.6	95.57	-	-	1992	-
-	11.7	88.47	-	-	1992	-
-	17.8	76.81	-	-	1992	-
-	27.5	54.35	-	-	1992	-
-	56.4	28.15	-	-	1992	-
-	92.4	16.70	-	-	1992	-
-	104.2	17.52	-	-	1992	-
-	104.4	21.49	-	-	1992	-
-	106.9	20.07	-	-	1992	-
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Wood et al. (2014)						
18611-5	5.0	105.26	0.44	-15.70	2011	-
18611-8	8.0	106.84	0.48	-17.10	2011	-
18611-11	11.0	104.26	0.42	-16.80	2011	-
18611-16	16.0	94.61	0.39	-15.90	2011	-
18611-21	21.0	80.30	0.39	-16.00	2011	-
18611-26	26.0	72.63	0.33	-15.90	2011	-
18779-5	5.0	107.39	0.55	-14.30	2011	-
18779-8	8.0	107.95	0.48	-15.60	2011	-
18779-11	11.0	107.03	0.42	-15.20	2011	-
18779-16	16.0	92.91	0.38	-15.80	2011	-
18779-21	21.0	79.14	0.36	-16.00	2011	-
18781-5	5.0	107.34	0.53	-15.10	2011	-
18781-8	8.0	104.73		-14.80	2011	-
18781-11	11.0	89.49	0.38	-13.90	2011	-
18781-16	16.0	54.55	0.28	-14.20	2011	-
18893-3	3.0	108.00	0.44	-15.40	2012	-
18893-5	5.0	104.99	0.37	-15.10	2012	-
18893-10	10.0	104.31	0.33	-16.80	2012	-
18893-12	12.0	101.32	0.31	-16.60	2012	-
18893-15	15.0	95.38	0.36	-16.60	2012	-
18893-18	18.0	86.20	0.32	-15.10	2012	-
18897-5	5.0	102.61	0.44	-13.50	2012	-

18897-6	6.0	108.69	0.35	-15.10	2012	-
18897-7	7.0	107.05	0.40	-14.70	2012	-
18897-8	8.0	106.42	0.36	-14.30	2012	-
Yang et al. (1985)						
1	12.8	120.55	0.66	-25.68	1984	Samples influenced by modern gas
2	20.3	67.42	0.87	-14.58	1984	Samples influenced by modern gas
3	28.3	62.57	1.95	-11.70	1984	Samples influenced by modern gas
3	28.3	79.96	1.45	-17.68	1985	Samples influenced by modern gas
4	39.9	77.37	1.52	-19.96	1984	Samples influenced by modern gas
4	39.9	87.57	1.08	-20.79	1985	Samples influenced by modern gas
5	61.3	77.35	0.79	-15.68	1984	Samples influenced by modern gas
5	61.3	72.15	0.88	-17.87	1985	Samples influenced by modern gas
6	81.1	77.24	1.48	-15.27	1984	Samples influenced by modern gas
7	106.1	76.98	0.90	-14.79	1984	Samples influenced by modern gas
7	106.1	72.88	0.74	-16.59	1985	Samples influenced by modern gas
8	128.3	74.62	0.67	-15.18	1984	Samples influenced by modern gas

20 **Table S2: Groundwater chemistry data from the Limestone Coast and the Ovens/ Goulburn-Broken catchments. Sample ID is used as the y-axis on Fig. 4 in the main document. Well ID numbers from original publications.**

Sample ID	Well ID	Sample year	Longitude	Latitude	Depth to water (mbg)	Sample depth (mbg)	$^{14}\text{C}_{\text{gw}}$ (pmC)	3H (TU)
Limestone Coast								
0	6923-3682	1989	140.487	-37.068	1.6	25.0	54.4	-
1	7021-1043	2009	140.791	-38.026	0.5	-	66.1	-
2	7022-128	2012	140.931	-37.848	27.8	24.4	62.4	-
3	7022-139	2012	140.922	-37.896	26.4	25.8	48.8	-
4	7022-837	1988-1990	140.882	-37.771	5.4	8.9	27.0	-
5	7022-1042	1988-1990	140.941	-37.552	2.0	6.2	78.2	-
6	7022-1094	1988-1990	140.839	-37.585	7.2	9.5	77.1	-
7	7022-1863	1988-1990	140.816	-37.546	12.2	22.0	62.5	-
8	7022-8517	2000	140.858	-37.604	6.1	22.6	14.1	-
9	7022-8518	2000	140.858	-37.604	5.3	15.8	19.3	-
10	7022-8519	36678	140.858	-37.604	6.0	10.0	59.2	-
11	7022-8520	2000	140.858	-37.604	6.0	5.3	83.0	-
12	7022-8522	2000	140.944	-37.551	8.5	37.0	48.8	-
13	7022-8523	2000	140.944	-37.551	10.1	29.0	56.8	-
14	7022-8524	2000	140.944	-37.551	10.0	18.5	64.7	-
15	7022-8525	2000	140.944	-37.551	8.0	7.5	72.8	-
16	7022-10572	2012	140.931	-37.842	27.5	83.5	13.4	-
17	7022-10573	2012	140.931	-37.833	18.5	76.0	69.6	-
18	7022-10574	2012	140.934	-37.822	10.3	56.3	77.3	-
19	7022-10687	2012	140.929	-37.859	26.9	140.0	6.7	-
20	7022-10688	2012	140.928	-37.861	25.8	37.0	5.2	-
21	7022-10776	1905	140.883	-37.545	5.6	44.0	84.7	-
22	7022-10778	1905	140.858	-37.603	25.7	63.5	57.2	-
23	7022-10781	2011	140.942	-37.549	22.7	60.5	44.5	-

24	7023-5280	2012	140.841	-37.367	6.5	62.5	9.7	-
25	7023-7133	2012	140.942	-37.269	7.2	15.0	64.5	-
26	7023-7134	2012	140.962	-37.257	17.5	45.5	68.5	-
27	7023-7135	2012	140.929	-37.284	6.6	40.0	44.3	-
28	7024-2960	1989	140.923	-36.871	10.6	15.0	63.6	-
29	7024-5457	2003	140.585	-36.642	5.3	10.5	82.9	-
30	7024-5458	2003	140.592	-36.655	5.8	12.3	71.0	-
31	7024-5459	2005	140.565	-36.668	12.4	41.0	36.5	-
32	7024-5460	2005	140.579	-36.661	15.3	44.5	11.8	-
33	7024-5462	2005	140.542	-36.650	22.5	19.7	54.1	-
34	7024-5463	2005	140.578	-36.661	14.7	47.0	5.2	-
35	7024-5464	2005	140.579	-36.661	15.6	18.0	70.1	-
36	7024-5465	2005	140.579	-36.661	15.6	21.5	61.4	-
37	7024-5466	2005	140.579	-36.661	16.2	32.3	43.3	-
38	7024-5468	2005	140.559	-36.671	11.4	15.3	55.5	-
39	7024-5470	2005	140.561	-36.640	7.5	26.0	73.8	-
40	7024-5471	2005	140.576	-36.642	7.5	12.1	73.5	-
41	7025-865	2015	140.663	-36.303	16.5	32.7	67.6	-
42	7025-868	2015	140.655	-36.300	10.7	32.0	60.8	-
43	7025-2615	2015	140.661	-36.299	9.4	21.2	62.0	-
44	7025-3222	2015	140.658	-36.299	11.5	32.5	61.0	-
45	7025-3875	2015	140.668	-36.298	16.7	28.0	46.1	-
46	7025-3876	2015	140.663	-36.302	15.5	31.0	55.6	-
47	7025-3877	2015	140.663	-36.302	15.4	31.0	49.2	-
48	7025-4030	2015	140.663	-36.307	16.1	28.0	56.9	-
49	7025-4031	2015	140.663	-36.291	15.4	28.0	61.1	-
50	7026-113	1998	140.796	-35.817	68.8	100.2	3.6	-

Ovens/ Goulburn-Broken

51	51743	2009	146.992	-36.726	1.36	8.0	92.81	1.27
52	51744	2009	146.988	-36.732	2.5	9.0	99.9	3.62
53	51737	2009	146.983	-36.725	5.25	39.0	88.6	1.21
54	51738	2009	146.982	-36.727	-0.07	60.5	73.9	0.84
55	51735	2009	146.982	-36.728	5.69	36.0	99.0	1.39
56	51736	2009	146.982	-36.728	4.99	23.0	105.5	1.81
57	109462	2009	146.976	-36.728	3.6	48.0	94.1	1.42
58	88274	2009	146.924	-36.703	1.4	44.0	77.0	0.07
59	48069	2009	146.864	-36.643	2.03	6.5	76.1	1.70
60	48068	2009	146.862	-36.644	3.04	10.0	106.6	2.34
61	48067	2009	146.860	-36.644	2.73	12.0	104.2	2.69
62	48066	2009	146.859	-36.645	3.96	12.0	100.8	2.29
63	83232	2009	146.719	-36.566	3.23	9.0	101.8	1.82
64	83231	2009	146.717	-36.568	3.7	11.0	96.5	2.13
65	83229	2009	146.716	-36.569	3.08	11.0	100.4	2.25
66	83230	2009	146.716	-36.569	3.3	11.0	99.8	2.62
67	50788	2009	146.330	-36.298	14.75	66.0	30.3	0.16
68	50789	2009	146.325	-36.303	14.25	24.0	88.8	0.04
69	11326	2009	146.309	-36.206	12.83	23.7	93.9	0.30
70	302296	2009	146.356	-36.151	11.99	73.8	75.3	0.02
71	11323	2009	146.356	-36.151	11.65	17.4	91.2	0.94
72	11306	2009	146.251	-36.191	3.89	15.8	103.3	0.26
73	11311	2009	146.192	-36.092	3.01	16.2	97.2	0.60
74	11310	2009	146.189	-36.092	9.45	13.9	95.9	0.49
75	117	1985-1994	145.663	-36.540	4.1	50.0	49.4	0.43
76	119	1987-2004	145.680	-36.540	7.9	53.0	75.5	0.79

77	120	1987-2004	145.676	-36.523	11.4	76.0	41.6	1.45
78	121	1987-2004	145.630	-36.477	4.0	76.0	5.2	0.47
79	124	1987-2004	145.666	-36.485	27.2	81.5	65.6	0.40
80	125	1987-2004	145.680	-36.487	41.3	78.0	17.7	0.63
81	130	1987-2004	145.636	-36.498	25.7	94.5	74.5	0.74
82	132	1987-2004	145.630	-36.520	2.3	76.0	43.2	0.95
83	133	1987-2004	145.612	-36.539	12.5	76.0	41.0	0.75
84	143	1987-2004	145.651	-36.466	3.6	61.0	28.0	0.61
85	8113	1980-2004	145.630	-36.557	2.6	19.7	51.6	0.24
86	8121	1980-2004	145.594	-36.489	3.2	16.6	97.9	2.44
87	8124	1980-2004	145.705	-36.459	2.0	13.0	47.1	0.93
88	8127	1980-2004	145.711	-36.447	2.8	19.7	54.1	0.48
89	8130	1980-2004	145.711	-36.436	3.1	16.6	65.9	0.28
90	8142	1983-2004	145.649	-36.489	13.0	19.8	85.9	1.55
91	8143	1983-2004	145.648	-36.484	8.2	18.1	83.6	0.98
92	8145	1983-2004	145.634	-36.485	3.2	20.3	86.3	0.62
93	8126*	1980-2004	145.705	-36.459	0.4	3.1	100.1	1.70
94	8131*	1980-2004	145.712	-36.436	3.3	4.9	94.7	1.01
95	8135*	1983-2004	145.627	-36.565	7.5	7.3	103.2	1.90
96	8144*	1983-2004	145.648	-36.484	8.2	11.0	92.4	0.52
97	153	1984-2004	145.933	-36.674	2.1	100.0	77.5	0.67
98	155	1984-2004	145.937	-36.675	4.2	30.0	91.3	3.34
99	8402	1982-2005	145.933	-36.674	4.7	15.4	88.3	2.53
100	8403	1982-2005	145.933	-36.676	2.9	19.4	84.3	1.56
101	8416	1982-2005	145.924	-36.663	3.0	15.8	97.5	1.63
102	8420	1982-2005	145.932	-36.681	2.3	18.0	99.2	0.80
103	8404*	1982-2005	145.933	-36.676	3.2	7.5	96.4	1.46
104	8412*	1982-2005	145.931	-36.662	1.5	5.1	105.1	1.80
105	8415*	1982-2005	145.932	-36.664	8.2	6.1	102.9	1.94
106	8421*	1983-2005	145.932	-36.681	1.5	5.3	97.9	1.89
107	11203*	1989-1998	146.523	-36.395	3.2	9.3	94.5	2.09
108	11205*	1989-1998	146.525	-36.398	2.2	2.9	90.3	0.81
109	11206	1989-1999	146.526	-36.400	2.4	9.5	94.5	1.69
110	11207	1989-2000	146.526	-36.403	8.5	17.7	93.4	1.02
111	11451	1999-2000	146.526	-36.378	2.3	11.0	61.5	0.14
112	11452	1999-2000	146.526	-36.378	0.3	12.9	92.5	3.31

Table S3: Calculated MRTs using Eqs. 2-4. MRTs calculated from ^{14}C are typically rounded to the nearest 5 to 100 years (e.g., Fontes and Garnier, 1979; Plummer and Sprinkle, 2001; Carmi et al., 2009). Here the MRTs are rounded to the nearest 10 years. Well ID numbers from original publications.

Sample ID	Well ID	Depth to Water (mbg)	$^{14}\text{C}_{\text{gw}}$ (pmC)	Uncorrected MRT (y)	DTW-corrected MRT, lower (y) (Eq. 4)	DTW-corrected, best MRT, (y) (Eq. 2)	DTW-corrected MRT, upper (y) (Eq. 3)
Limestone Coast							
0	6923-3682	1.6	54.4	5030	3230	5180	7200
1	7021-1043	0.5	66.1	3420	1770	3730	5740
2	7022-128	27.8	62.4	3900	500	500	2460

3	7022-139	26.4	48.8	5940	610	2620	4690
4	7022-837	5.4	27.0	10820	8480	10450	12470
5	7022-1042	2.0	78.2	2030	500	2130	4140
6	7022-1094	7.2	77.1	2150	500	1520	3540
7	7022-1863	12.2	62.5	3890	570	2550	4590
8	7022-8517	6.1	14.1	16200	13750	15720	17740
9	7022-8518	5.3	19.3	13600	11260	13230	15250
10	7022-8519	6.0	59.2	4330	1900	3870	5890
11	7022-8520	6.0	83.0	1540	500	1070	3100
12	7022-8522	8.5	48.8	5930	3140	5110	7140
13	7022-8523	10.1	56.8	4680	1660	3630	5660
14	7022-8524	10.0	64.7	3600	600	2580	4610
15	7022-8525	8.0	72.8	2620	500	1880	3910
16	7022-10572	27.5	13.4	16650	11160	13180	15250
17	7022-10573	18.5	69.6	2990	500	780	2830
18	7022-10574	10.3	77.3	2130	500	1070	3100
19	7022-10687	26.9	6.7	22310	16900	18920	20990
20	7022-10688	25.8	5.2	24430	19170	21180	23250
21	7022-10776	5.6	84.7	1370	500	960	2980
22	7022-10778	25.7	57.2	4620	500	1390	3460
23	7022-10781	22.7	44.5	6690	1880	3890	5950
24	7023-5280	6.5	9.7	19250	16750	18720	20740
25	7023-7133	7.2	64.5	3620	1020	2990	5010
26	7023-7134	17.5	68.5	3130	500	1060	3110
27	7023-7135	6.6	44.3	6730	4200	6170	8200
28	7024-2960	10.6	63.6	3740	650	2630	4660
29	7024-5457	5.3	82.9	1550	500	1180	3200
30	7024-5458	5.8	71.0	2830	500	2390	4420
31	7024-5459	12.4	36.5	8330	4990	6970	9010
32	7024-5460	15.3	11.8	17670	13910	15900	17950
33	7024-5462	22.5	54.1	5080	500	2300	4360
34	7024-5463	14.7	5.2	24440	20770	22760	24800
35	7024-5464	15.6	70.1	2940	500	1130	3170
36	7024-5465	15.6	61.4	4030	500	2220	4260
37	7024-5466	16.2	43.3	6920	3030	5020	7070
38	7024-5468	11.4	55.5	4870	1670	3650	5680
39	7024-5470	7.5	73.8	2510	500	1840	3860
40	7024-5471	7.5	73.5	2550	500	1870	3900
41	7025-865	16.5	67.6	3240	500	1310	3360
42	7025-868	10.7	60.8	4120	1020	2990	5030
43	7025-2615	9.4	62.0	3950	1040	3020	5050
44	7025-3222	11.5	61.0	4090	880	2860	4890
45	7025-3875	16.7	46.1	6400	2440	4440	6480
46	7025-3876	15.5	55.6	4850	1070	3050	5100
47	7025-3877	15.4	49.2	5860	2090	4080	6130
48	7025-4030	16.1	56.9	4660	790	2780	4830
49	7025-4031	15.4	61.1	4080	500	2290	4330
50	7026-113	68.8	3.6	27480	16130	18230	20400
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Ovens/ Goulburn-Broken							
51	51743	1.4	92.8	620	500	800	2810
52	51744	2.5	99.9	500	500	500	2050
53	51737	5.3	88.6	1000	500	640	2660
54	51738	-0.1	73.9	2500	930	2890	4900
55	51735	5.7	99.0	500	500	500	1680

56	51736	5.0	105.5	500	500	500	1260
57	109462	3.6	94.1	500	500	500	2390
58	88274	1.4	77.0	2160	500	2340	4350
59	48069	2.0	76.1	2260	500	2350	4370
60	48068	3.0	106.6	500	500	500	1430
61	48067	2.7	104.2	500	500	500	1670
62	48066	4.0	100.8	500	500	500	1770
63	83232	3.2	101.8	500	500	500	1790
64	83231	3.7	96.5	500	500	500	2170
65	83229	3.1	100.4	500	500	500	1920
66	83230	3.3	99.8	500	500	500	1950
67	50788	14.8	30.3	9880	6200	8190	10230
68	50789	14.3	88.8	980	500	500	1400
69	11326	12.8	93.9	520	500	500	1140
70	302296	12.0	75.3	2340	500	1040	3080
71	11323	11.7	91.2	760	500	500	1540
72	11306	3.9	103.3	500	500	500	1580
73	11311	3.0	97.2	500	500	500	2210
74	11310	9.5	95.9	500	500	500	1430
75	117	4.1	49.4	5830	3670	5630	7650
76	119	7.9	75.5	2320	500	1600	3620
77	120	11.4	41.6	7250	4060	6040	8070
78	121	4.0	5.2	24440	22300	24260	26280
79	124	27.2	65.6	3490	500	500	2120
80	125	41.3	17.7	14320	6860	8910	11010
81	130	25.7	74.5	2430	500	500	1280
82	132	2.3	43.2	6940	5030	6990	9000
83	133	12.5	41.0	7370	4010	6000	8030
84	143	3.6	28.0	10520	8430	10390	12410
85	8113	2.6	51.6	5470	3520	5480	7490
86	8121	3.2	97.9	500	500	500	2120
87	8124	2.0	47.1	6220	4360	6320	8340
88	8127	2.8	54.1	5080	3100	5060	7080
89	8130	3.1	65.9	3450	1430	3390	5400
90	8142	13.0	85.9	1260	500	500	1850
91	8143	8.2	83.6	1480	500	700	2730
92	8145	3.2	86.3	1220	500	1150	3160
93	8126*	0.4	100.1	500	500	500	2320
94	8131*	3.3	94.7	500	500	500	2380
95	8135*	7.5	103.2	500	500	500	1100
96	8144*	8.2	92.4	650	500	500	1910
97	153	2.1	77.5	2110	500	2190	4200
98	155	4.2	91.3	750	500	540	2560
99	8402	4.7	88.3	1030	500	740	2760
100	8403	2.9	84.3	1410	500	1380	3390
101	8416	3.0	97.5	500	500	500	2180
102	8420	2.3	99.2	500	500	500	2130
103	8404*	3.2	96.4	500	500	500	2250
104	8412*	1.5	105.1	500	500	500	1770
105	8415*	8.2	102.9	500	500	500	1020

106	8421*	1.5	97.9	500	500	500	2350
107	11203*	3.2	94.5	500	500	500	2410
108	11205*	2.2	90.3	840	500	920	2930
109	11206	2.4	94.5	500	500	510	2530
110	11207	8.5	93.4	560	500	500	1770
111	11451	2.3	61.5	4020	2110	4070	6080
112	11452	0.3	92.5	640	500	970	2980

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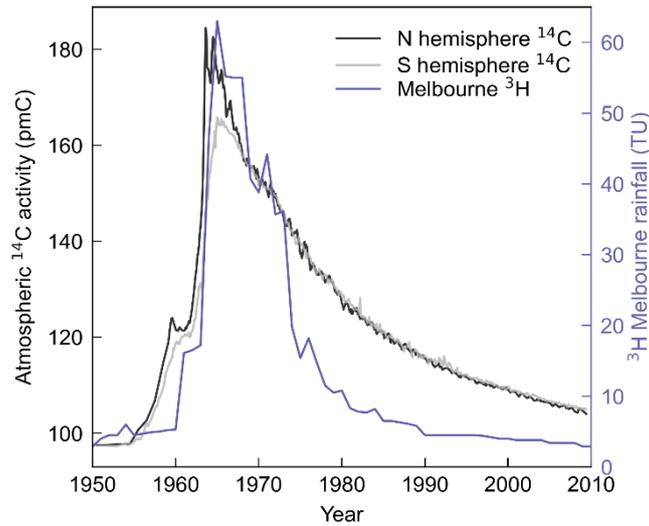


Figure S1: Atmospheric ^{14}C activities (pmC) for the northern (black) and southern (grey) hemispheres and ^3H activities (TU) for Melbourne in Australia (purple). ^{14}C data from Hua et al. (2013). ^3H data from Cartwright et al. (2018).

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