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Supplement of

Technical note: A software framework for calculating compositionally dependent in situ ^{14}C production rates

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Table S1: *In situ* ^{14}C global calibration dataset formatted for production rate calibration input to University of Washington online calculator, version 3 (Balco et al., 2008; http://hess.ess.washington.edu/math/v3/v3_cal_in.html). This dataset can be copied and pasted directly into the input data block field. Data from Borchers et al. (2016), Phillips et al. (2016), Schimmelpfennig et al. (2012), and Young et al. (2014). NL gratefully acknowledges the following colleagues for providing samples from surfaces at secular equilibrium, as part of the CRONUS-Earth project (NSF EAR-0345150): Tibor Dunai (CA-05A, northern Chile), Jay Quade (SPN samples, northern Chile), John Stone (98-PCM and WBC samples, Antarctica).

05PPT-01	41.26367	-112.47527	1603	std	3	2.65	0.978	0	2005	;	05PPT-01	C-14	quartz	344740	10630	;	05PPT-01	true_t	Bonneville	18300	300	;
05PPT-02	41.26367	-112.47527	1603	std	3	2.65	0.994	0	2005	;	05PPT-02	C-14	quartz	327590	6700	;	05PPT-02	true_t	Bonneville	18300	300	;
05PPT-03	41.26356	-112.4758	1600	std	5	2.65	0.962	0	2005	;	05PPT-03	C-14	quartz	336220	18810	;	05PPT-03	true_t	Bonneville	18300	300	;
05PPT-04	41.26362	-112.47693	1598	std	2.5	2.66	0.982	0	2005	;	05PPT-04	C-14	quartz	330140	8660	;	05PPT-04	true_t	Bonneville	18300	300	;
05PPT-05	41.2639	-112.47498	1605	std	3	2.67	0.99	0	2005	;	05PPT-05	C-14	quartz	357560	11670	;	05PPT-05	true_t	Bonneville	18300	300	;
05PPT-08	41.26379	-112.47476	1606	std	2.5	2.68	0.986	0	2005	;	05PPT-08	C-14	quartz	368590	15820	;	05PPT-08	true_t	Bonneville	18300	300	;
06HKY-01	57.41523	-5.64637	134	std	2	2.52	0.98	0	2006	;	06HKY-01	C-14	quartz	117490	15540	;	06HKY-01	true_t	Scotland	11700	300	;
06HKY-03	57.4155	-5.64662	131	std	6.7	2.47	0.981	0	2006	;	06HKY-03	C-14	quartz	100780	6620	;	06HKY-03	true_t	Scotland	11700	300	;
06HKY-04	57.42302	-5.65808	137	std	4	2.59	0.956	0	2006	;	06HKY-04	C-14	quartz	118090	7820	;	06HKY-04	true_t	Scotland	11700	300	;
06HKY-05	57.48743	-5.44933	521	std	3.5	2.55	0.987	0	2006	;	06HKY-05	C-14	quartz	144320	12210	;	06HKY-05	true_t	Scotland	11700	300	;
06HKY-06	57.48755	-5.44978	527	std	3.5	2.53	0.987	0	2006	;	06HKY-06	C-14	quartz	155910	21320	;	06HKY-06	true_t	Scotland	11700	300	;
06HKY-07	57.4878	-5.4477	500	std	6.5	2.59	0.989	0	2006	;	06HKY-07	C-14	quartz	124260	21430	;	06HKY-07	true_t	Scotland	11700	300	;
06HKY-08	57.48863	-5.44705	502	std	3	2.58	0.988	0	2006	;	06HKY-08	C-14	quartz	146950	15000	;	06HKY-08	true_t	Scotland	11700	300	;
06HKY-09	57.48863	-5.44705	502	std	5	2.51	0.976	0	2006	;	06HKY-09	C-14	quartz	140500	14950	;	06HKY-09	true_t	Scotland	11700	300	;
06HKY-10	57.48732	-5.44863	510	std	6	2.59	0.987	0	2006	;	06HKY-10	C-14	quartz	128260	19410	;	06HKY-10	true_t	Scotland	11700	300	;
06HKY-11	57.48747	-5.44995	528	std	4.5	2.58	0.987	0	2006	;	06HKY-11	C-14	quartz	157140	14940	;	06HKY-11	true_t	Scotland	11700	300	;

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11QOO-03 69.2844 -50.7569350 std 1 2.65 0.995 0 2011 ; 11QOO-
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DV-18 36.2185 -116.90119 76 std 3 2.65 0.999 0 2000 ; DV-18
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DV-9 36.5272 -117.2208 480 std 4 2.65 0.999 0 2000 ; DV-9
C-14 quartz 144350 4100 ; DV-9 true_t DeathValley 50000 500 ;
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DV-3 C-14 quartz 348130 10940 ; DV-3 true_t DeathValley 50000 500
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WHM-25 37.91078 -118.3672154 std 2 2.65 0.985 0 2000 ;
WHM-25 C-14 quartz 490850 13330 ; WHM-25 true_t WhiteMtns
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BNR-3 C-14 quartz 661280 6290 ; BNR-3 true_t WhiteMtns 50000 500
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WHM-1 37.53481 -118.15325 2834 std 4 2.65 0.946 0 2000 ;
WHM-1 C-14 quartz 779070 12440 ; WHM-1 true_t WhiteMtns 50000 500
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WHM-6 37.49138 -118.16898 3200 std 4 2.65 0.944 0 2000 ;
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WHM-7 37.49062 -118.1712 3210 std 4 2.65 0.945 0 2000 ;
WHM-7 C-14 quartz 1005940 17210 ; WHM-7 true_t WhiteMtns 50000 500
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SPN-977 -24.07313 -70.20565 977 std 3 2.65 0.977 0 2002
; SPN-977 C-14 quartz 210260 42600 ; SPN-977 true_t Chile
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SPN-1921 -24.47725 -69.40802 1921 std 2 2.65 0.997 0 2002
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SPN-7D -24.5424-68.70927 3689 std 4 2.65 0.997 0 2002 ; SPN-7D
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SPN-11c -24.56542 -68.63415 4035 std 2.5 2.7 0.997 0 2002
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50000 500 ;
98-PCM-010-SRDK -70.86 68.13 225 std 3 2.7 1 0 1998 ;
98-PCM-010-SRDK C-14 quartz 183030 8420 ; 98-PCM-010-SRDK true_t
Antarctica 50000 500 ;
WBC-UVP -77.75 160.8 2160 std 5 2.5 1 0 1999 ; WBC-
UVP C-14 quartz 968970 15770 ; WBC-UVP true_t Antarctica 50000 500
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98-PCM-002-BVLK -70.82 68.17 100 std 3 2.8 1 0 1998 ;
98-PCM-002-BVLK C-14 quartz 160050 12860 ; 98-PCM-002-BVLK true_t
Antarctica 50000 500 ;
WBC-2020 -77.75 160.8 2020 std 5.5 2.5 1 0 1999 ; WBC-
2020 C-14 quartz 974370 19180 ; WBC-2020 true_t Antarctica 50000 500
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98-PCM-105-MNZ -73.44 61.9 2538 std 3 2.7 1 0 1998 ;
98-PCM-105-MNZ C-14 quartz 1177930 19490 ; 98-PCM-105-MNZ true_t
Antarctica 50000 500 ;

98-PCM-067-MNZ -73.39 61.72 2137 std 3 2.7 1 0 1998 ;
98-PCM-067-MNZ C-14 quartz 1038010 20640 ; 98-PCM-067-MNZ true_t
Antarctica 50000 500 ;
CRONUS-A -77.88302 160.94308 1666 std 4 2.1 0.999 0 2004
; CRONUS-A C-14 quartz 713510 13360 ; CRONUS-A true_t
Antarctica 50000 500 ;

Table S2: Predicted modern *in situ* ^{14}C spallogenic production rates (atoms g^{-1} y^{-1}) at SLHL from neutrons and protons in minerals and rock types considered, both theoretical (P_{CDpred}) and normalized to calibrated production in quartz ($P_{CD,GD}$) using the geocentric dipolar R_{CD} record of Lifton (2016).

Mineral	***Neutron P_{CDpred}***	***Proton P_{CDpred}***	***Total P_{CDpred}***	***$P_{CD,GD}$***	***% Diff $P_{CD,GD}$ vs. P_{Qcal}***
	at g^{-1} y^{-1}	*at g^{-1} y^{-1}*	*at g^{-1} y^{-1}*	*at g^{-1} y^{-1}*	
Quartz	15.37	0.47	15.84	13.71	0.0
Albite	15.49	0.48	15.97	13.82	0.8
Albite[1]	14.95	0.48	15.43	13.35	-2.6
Anorthite	13.43	0.42	13.85	11.98	-12.6
Orthoclase	13.20	0.39	13.60	11.77	-14.2
Forsterite	13.67	0.46	14.12	12.22	-10.9
Fayalite	9.01	0.27	9.28	8.03	-41.4
Wollastonite	11.85	0.36	12.21	10.57	-22.9
Augite	12.00	0.37	12.38	10.71	-21.9
Ferrosilite	10.46	0.32	10.78	9.33	-32.0
Enstatite	14.18	0.46	14.64	12.67	-7.6
Calcite	13.55	0.38	13.94	12.06	-12.0
Dolomite	14.96	0.44	15.40	13.33	-2.8
Rock					
Ultramafic	13.11	0.43	13.54	11.69	-14.5
Basalt	13.72	0.43	14.15	12.22	-10.7
Hi-Ca Granite	14.30	0.44	14.75	12.73	-6.9
Low-Ca Granite	14.52	0.45	14.97	12.93	-5.5
Granodiorite	14.27	0.44	14.71	12.70	-7.1

[1] Production calculated using the spliced TENDL-2019 and JENDL/HE-2007 proton and neutron excitation functions (Na_{TJ} in text). All other Na production rates use JENDL/HE-2007 exclusively.