Data Repository Item 2009113

SUPPORTING FIGURE FOR SAMPLING METHODS

Figure DR1. Strath-alluvium contact exposed along the SF Eel at the flight of terraces where samples 013, 014, 015 and 016 were collected. Note the large alluvial boulders in contact with the strath surface. Paleoerosion samples were collected underneath these large alluvial boulders to increase the likelihood that the sediment is in place and representative of the lateral planation phase.

Table DR1 - Cosmogenic ^{10}Be Sample Data

		Basin Averaged		Scaling Factors				Inheritance Production Rates[5]			Sample Site			Post-Depositional Production Rates			Raw Geochemical Data[6]	
		Latitude[1]	Altitude[2]	Preliminary[3]		Corrected[4]		$P_{0,n}$	P_{0,μ_stop}	P_{0,μ_fast}	Lat	Long	Altitude	$P_{0,n}$	P_{0,μ_stop}	P_{0,μ_fast}	Sample Mass	^{10}Be
Sample ID & Type	Location	(dd)	(m)	S_λ	M_λ	S_λ	M_λ	(atoms/g/yr)	(atoms/g/yr)	(atoms/g/yr)	(dd)	(dd)	(m)	(atoms/g/yr)	(atoms/g/yr)	(atoms/g/yr)	(g)	(atoms)
Modern																		
001	Ten Mile	39.7	665	1.69	1.29	1.64	1.25	7.13	0.108	0.095	39.76	-123.62	357	-	-	-	40.02	1,745,777
003	Elder	39.7	865	1.99	1.41	1.95	1.38	8.44	0.119	0.105	39.73	-123.63	441	-	-	-	20.03	1,367,014
004	Elder	39.7	799	1.89	1.37	1.86	1.35	8.05	0.116	0.102	39.73	-123.65	388	-	-	-	20.02	1,418,986
010	SF Eel	39.7	649	1.66	1.28	1.65	1.27	7.15	0.109	0.096	39.72	-123.65	395	-	-	-	40.04	1,840,247
011	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.73	-123.64	377	-	-	-	39.99	1,740,054
012	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.75	-123.63	345	-	-	-	20.14	1,383,546
JOH-21	JOH	39.7	585	1.57	1.24	1.55	1.22	6.73	0.105	0.092	39.72	-123.65	393	-	-	-	40.05	1,743,568
Lower & Middle Strath																		
002	Elder	39.7	801	1.89	1.37	1.85	1.34	8.03	0.116	0.102	39.73	-123.65	399	-	-	-	23.89	1,015,324
009	Elder	39.7	795	1.89	1.37	1.85	1.34	8.03	0.116	0.102	39.73	-123.65	390	-	-	-	26.17	758,029
014	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.73	-123.65	385	5.75	0.0971	0.0852	41.10	2,815,930
015	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.73	-123.65	383	5.75	0.0970	0.0851	35.82	3,312,677
016	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.73	-123.65	382	5.74	0.0970	0.0851	35.28	1,205,970
019	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.75	-123.63	348	5.57	0.0954	0.0837	42.11	1,801,491
JOH-06	JOH	39.7	585	1.57	1.24	1.55	1.22	6.73	0.105	0.092	39.72	-123.65	401	5.83	0.0978	0.0858	67.68	2,198,415
Upper Strath																		
006	Elder	39.7	809	1.91	1.38	1.87	1.35	8.11	0.117	0.102	39.73	-123.64	404	5.85	0.0980	0.0860	29.37	954,476
013	SF Eel	39.7	661	1.68	1.28	1.66	1.27	7.22	0.110	0.096	39.73	-123.65	389	5.77	0.0973	0.0853	21.68	519,849

[1]A latitude of 40° was used for all samples to calculate the scaling factors based on the equations in Stone, 2000

[2]Altitude is shown as a reference but was not used in calculation as all calculations were performed for each grid cell in the basin and then average

[3]Calculated for each grid cell in the basin and then averaged. S_λ and M_λ are the scaling factors for production due to spallation and muon capture respectively.

[4]Reflects the scaling factors after a correction for topographic shielding. These corrected scaling factors were used to calculate the production rates

[5]Based on a SLHL total production rate of 4.5 atoms g^{-1} yr^{-1} and production equations of Stone (2000). The fraction due to spallogenic production (f_{sp}) is 0.964 based on Schaller, 2002.

[6]Blank values: modern samples = 555,288 atoms; strath samples 002, 014 and 015 = 123,287 atoms; other strath samples = 82,017 atoms

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SUPPORTING DATA FOR OPTICALLY STIMULATED LUMINESCENCE (OSL) DATING

Table DR2. OSL dating results.

TCN ID	OSL ID	N[1]	M/m[2]	Equivalent Dose[3] (Gy)	Dose Rate (Gy/ky)	OSL Age (ky)
006	ELD-05	19/20	1.00	79.62 ± 5.94	2.395 ± 0.210	33.3 ± 4.1
013	SFG-25	93/96	1.03	46.42 ± 1.85	2.265 ± 0.142	20.5 ± 3.3
014	SFI-24	97/99	1.04	27.65 ± 1.02	2.353 ± 0.181	11.8 ± 1.1
015	SFK-23	89/92	1.06	22.30 ± 1.06	2.418 ± 0.159	9.2 ± 0.8
016	SFN-22	47/48	1.04	19.58 ± 0.88	2.366 ± 0.161	8.3 ± 0.8
019	SFE-20	62/64	1.02	12.35 ± 0.47	1.927 ± 0.215	6.4 ± 0.8
JOH-06	JOH-07	108/110	1.08	14.54 ± 0.47	1.943 ± 0.119	7.5 ± 0.6

[1]Number of aliquots suitable for analysis / number of aliquots measured; governed by the amount of clean quartz that could be extracted from each sample.
[2]Mean/median ratio used as a measure of asymmetry (see Lepper et al., 2007).
[3]Mean and std. err. used in all cases except JOH-07, the distribution with the highest asymmetry, in which case the “leading edge” dose was used (see Lepper et al., 2007).

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SUPPORTING DATA FOR OPTICALLY STIMULATED LUMINESCENCE (OSL) DATING

Table DR3. Sample depth and concentrations of dosimetrically significant elements.

OSL ID	Sample depth (cm)	[K] (ppm)	[Rb] (ppm)	[Th] (ppm)	[U] (ppm)
ELD-05	150	15908 ± 2233	67.75 ± 9.31	5.779 ± 0.494	2.522 ± 0.275
SFG-25	644	15505 ± 1388	76.67 ± 8.97	5.636 ± 0.448	2.318 ± 0.310
SFI-24	415	16190 ± 1959	64.39 ± 7.62	6.220 ± 0.507	2.307 ± 0.242
SFK-23	369	16319 ± 1657	69.39 ± 8.07	6.229 ± 0.509	2.521 ± 0.257
SFN-22	318	16377 ± 1709	79.04 ± 7.76	5.873 ± 0.475	2.325 ± 0.232
SFE-20	130	10521 ± 2288	77.21 ± 6.57	6.276 ± 0.500	2.236 ± 0.213
JOH-07	180	11227 ± 1101	58.88 ± 6.99	5.564 ± 0.456	1.941 ± 0.206

Elemental analysis by INAA performed at the Ohio State University Research Reactor.
Pore water content of 12±3% used for all samples.
Beta attenuation coefficient of 0.90 was used for all samples corresponding to the grain size range 90-250 μm.