## SUPPLEMENTAL TABLE 1. BEDROCK ELEMENT ABUNDANCES\*

Site	Avg	[Na] (Min-Max) (%)	Avg	[Mg] (Min-Max) (%)	Avg	[Ca] (Min-Max) (%)	Avg	[K] (Min-Max) (%)	<b>N</b> †	
Fall River	1.8	(1.6-2.0)	0.5	(0.2-1.3)	1.9	(1.6-2.7)	0.7	(0.6-1.0)	12	•
Grizzly Dome	1.6	(1.4-2.0)	2.0	(1.8-2.4)	4.0	(3.4-5.7)	0.7	(0.2-1.0)	6	
Antelope Lake	1.5	(1.4-1.5)	1.7	(1.3-2.1)	3.9	(3.2-4.6)	1.0	(0.9-1.3)	10	
Adams Peak	1.5	(1.5-1.6)	1.0	(0.8-1.2)	2.8	(2.5-3.3)	1.3	(1.1-1.5)	14	
Fort Sage	1.4	(1.3-1.5)	1.0	(0.9-1.2)	2.9	(2.7-3.1)	1.2	(1.1-1.5)	7	
Sunday Peak	1.6	(1.6-1.8)	0.2	(0.2-0.3)	1.3	(1.2-1.4)	1.5	(1.2-2.0)	9	
Nichols Peak	1.4	(1.3-1.5)	1.1	(1.0-1.2)	3.0	(2.7-3.4)	1.2	(1.0-1.4)	5	
Site		[Al]		[Si]		[Zr]		[Sr]	Nţ	
	Avg	(Min-Max)	Avg	(Min-Max)	Avg	(Min-Max)	Avg	(Min-Max)		
		(%)		(%)	(	(ppm)	(	(ppm)		
Fall River	4.3	(4.0-4.5)	33.6	(31.7-34.8)	78	(55-112)	442	(367-521)	12	
Grizzly Dome	4.4	(4.2-5.2)	29.2	(25.9-30.5)	174	(147-204)	487	(434-613)	6	
Antelope Lake	4.4	(4.2-4.6)	28.6	(27.7-30.3)	179	(106-251)	432	(389-468)	10	
Adams Peak	4.3	(4.2-4.5)	31.1	(30.1-31.9)	97	(90-105)	502	(440-567)	14	
Fort Sage	4.3	(4.2-4.3)	31.1	(30.8-31.4)	102	(88-110)	399	(375-419)	7	
Sunday Peak	3.8	(3.7-4.1)	33.7	(33.5-34.3)	233	(200-275)	134	(120-146)	9	
Nichols Peak	4.3	(4.1-4.3)	30.6	(30.1-31.3)	137	(120-156)	584	(531-615)	5	

<sup>\*</sup>Average, minimum, and maximum concentrations from XRF analysis. Major elements reported in weight percent and normalized for loss on ignition.

†Number of samples. Samples were collected from widely distributed outcrops at each site.

SUPPLEMENTAL TABLE 2. COSMOGENIC NUCLIDE DATA FOR STUDY CATCHMENTS

SUPPLEMENTAL TABLE 2. COSMOGENIC NUCLIDE DATA FOR STUDY CATCHMENTS									
Sample	10Be/9Be*	<sup>26</sup> Al/ <sup>27</sup> Al*	[ <sup>10</sup> Be]†	[ <sup>26</sup> Al]†	[ <sup>26</sup> Al]/[ <sup>10</sup> Be]§				
	(10 <sup>-15</sup> )	(10 <sup>-15</sup> )	(10 <sup>5</sup> atoms/g)	(10 <sup>6</sup> atoms/g)	1 2010				
<del>.</del>									
Fall River:									
FR-2	47.7±7.4	302±29	0.517±0.084	0.234±0.025	4.52±0.88				
FR-4	35.9±8.4	162±13	0.198±0.047	0.115±0.011	5.83±1.50				
FR-5	33±7	663±60	0.395±0.085	0.258±0.027	6.53±1.56				
FR-6	279±12	1009±34	2.562±0.169	0.980±0.059	3.83±0.34				
FR-7	341±13	1705±100	3.412±0.215	1.092±0.084	3.20±0.32				
FR-8	556±15	2835±89	5.523±0.314	2.898±0.171	5.25±0.43				
FR-9	473±19	2059±69	4.758±0.305	2.215±0.133	4.66±0.41				
FR-10	202.7±9.1	1253±42	2.751±0.185	1.645±0.099	5.74±0.58				
Crizzly Dom	201	•							
Grizzly Dom GD-1	108±12	422±24	0.651±0.079	0.362±0.027	5.57±0.80				
GD-1 GD-2	150.2±9.3	677±28	0.963±0.077	0.600±0.039	6.23±0.64				
GD-2 GD-3	130.2±9.5 130.1±8.6	604±23	0.905±0.077	0.624±0.039	6.90±0.72				
GD-3 GD-4	339±12	1381±61	1.719±0.105	1.077±0.072	6.27±0.57				
GD-4 GD-5	274±10	1395±51	1.807±0.112	1.120±0.069	6.20±0.54				
GD-6	241±14	1462±57	1.515±0.116	0.973±0.062	6.42±0.64				
GD-9	215±11	2456±160	1.717±0.123	1.293±0.106	7.53±0.82				
GD-9 GD-10	126±12	375±17	0.740±0.079	0.352±0.024	4.76±0.60				
GD-10	69.7±7.8	206±14	0.553±0.068	0.357±0.030	6.46±0.96				
GD-13	104.4±8.5	379±14	0.741±0.071	0.431±0.027	5.81±0.66				
GD-14	79.6±9.6	803±41	0.610±0.080	0.417±0.030	6.83±1.02				
		000211	0.01020.000	0.717 = 0.000	0.00=02				
Antelope La	ake:	F00 00	0.407.0.040	0.044.0.407	0.00.0.00				
AL-2	225±11	596±22	3.467±0.242	2.211±0.137	6.38±0.60				
AL-3	355±12	1516±41	3.284±0.198	1.542±0.088	4.70±0.39				
AL-4	402±17	2213±55	5.328±0.349	2.847±0.159 2.444±0.137	5.34±0.46 5.84±0.54				
AL-5	374±20	1563±39	4.189±0.307	2.444±0.137 3.163±0.178	6.36±0.55				
AL-6	424±18	3296±84	4.975±0.323	4.494±0.251	5.46±0.44				
AL-7	709±20	3891±97	8.224±0.472	4.494±0.251 2.266±0.127	5.46±0.44 5.43±0.46				
AL-8	256±9.9	1082±27	4.170±0.264 3.122±0.215	1.843±0.104	5.45±0.46 5.90±0.53				
AL-9	275±13	1341±35	3.122±0.215 4.008±0.274		5.89±0.52				
AL-10	278±13	1323±35		2.359±0.133					
AL-11	444±12	1816±45	6.221±0.354	3.285±0.183	5.28±0.42				
Adams Pea									
AP-1	508±16	3003±150	4.351±0.137	2.617±0.290	6.01±0.69				
AP-2	344±11	1751±75	3.961±0.127	2.334±0.250	5.89±0.66				
AP-3	205±13	1484±72	3.030±0.192	1.990±0.220	6.57±0.84				
AP-4	297±14	1870±55	4.090±0.193	2.642±0.280	6.46±0.75				
AP-5	168.6±8.1	1229±46	2.538±0.122	1.584±0.170	6.24±0.73				
AP-6	141±13	N.D.**	3.118±0.287	N.D.**	N.D.**				
AP-7	144±8	1011±38	2.351±0.129	1.569±0.170	6.67±0.81				
AP-9	177.1±8.6	1147±40	2.560±0.124	1.661±0.180	6.49±0.77				
AP-11	540±26	2342±61	5.915±0.411	2.993±0.169	5.06±0.45				
AP-13	233.9±9.5	1460±42	3.239±0.209	1.813±0.105	5.60±0.48				
AP-14	156.9±9.1	944±40	2.826±0.216	1.484±0.097	5.25±0.53				
Sunday Pe	<u>ak:</u>								
SP-1	284±16	1060±28	3.189±0.242	2.167±0.123	6.80±0.64				
SP-3	522±11	1809±47	5.063±0.275	2.673±0.151	5.28±0.41				
SP-4	211±11	1050±41	1.675±0.121	1.224±0.078	7.31±0.70				
SP-7	157.8±9.6	1407±74	2.770±0.218	1.385±0.100	5.00±0.54				

SUPPLEMENTAL TABLE 2. (continued)

Sample	<sup>10</sup> Be/ <sup>9</sup> Be* (10 <sup>-15</sup> )	<sup>26</sup> Al/ <sup>27</sup> Ai* (10 <sup>-15</sup> )			[ <sup>26</sup> Al]/[ <sup>10</sup> Be]§
Sunday Pea	ak (continued):			- "	
SP-8	921±33	3734±92	6.063±0.373	3.417±0.190	5.64±0.47
SP-9	498±14	2680±66	3.956±0.227	2.440±0.136	6.17±0.49
SP-19	937±24	8346±270	15.870±0.892	9.758±0.581	6.15±0.50
Nichols Pea	ık:				
NP-1	80.9±8.6	745±38	1.647±0.194	0.977±0.070	5.93±0.82
NP-4	242±15	1476±64	3.040±0.242	2.141±0.142	7.04±0.73
NP-6	205±14	1129±41	2.290±0.192	1.405±0.087	6.13±0.64
NP-7	109±12	469±38	2.067±0.250	0.937±0.089	4.53±0.7
NP-10	46±11	N.D.**	1.343±0.331	N.D.**	N.D.**
NP-14	48.5±7.2	396±51	1.393±0.218	0.781±0.108	5.61±1.17
NP-15	N.D.**	783±32	N.D.**	0.983±0.064	N.D.**
NP-17	78.4±6.8	889±50	2.054±0.206	1.151±0.087	5.60±0.70
NP-18	116.3±7.2	1269±77	2.612±0.208	1.557±0.122	5.96±0.67

\*We physically and chemically isolated quartz from our stream sediment samples using the techniques of Kohl and Nishiizumi (1992) and Granger (1996), and then spiked the isolates with ~1.25  $\mu g$  Be per gram of quartz. We then dissolved the quartz and extracted its Be and Al using ion exchange chomatography. BeO and Al<sub>2</sub>O<sub>3</sub> targets were prepared for Accelerator Mass Spectrometry, which yields measurements of <sup>10</sup>Be/Be and <sup>26</sup>Al/<sup>27</sup>Al (Davis et al., 1990).

†<sup>10</sup>Be concentrations are calculated using the <sup>10</sup>Be/<sup>9</sup>Be and concentrations of Be in the quartz, which we know precisely from measurements of quartz masses and Be spike masses. <sup>26</sup>Al concentrations are calculated using <sup>26</sup>Al/<sup>27</sup>Al and concentrations of aluminum in quartz, which we measured from sample aliquots using Atomic Absorption Spectrophotometry and Inductively Coupled Plasma - Atomic Emission Spectrometry.

§Uncertainties in [<sup>26</sup>Al]/[<sup>10</sup>Be] are propagated from analytical uncertainties in the Al and Be analyses. \*\*N.D. = not determined.

Allitude   Lat   Long   Gradient*   Zi   Gross   depths   factor#   factor#   factor*   mm/k.y.		SUPF	PLEMENTA	AL TABLE 3	. STUD		ENT MORP		AND EROS	SION RATES	3
Fall River (Map = Brush Creek; Average   Z   <sub>sex</sub>   Z   <sub>sex</sub>   Z   <sub>sex</sub> = 1.36±0.05; Average soil depth = 41±3)	Sample		Location		Area	Average	[Zr] <sub>soil</sub> †	Soil	Dissolution	Shielding	Erosion
Fall Rilver (Map = Brush Creek; Average [ZI] <sub>sov</sub> [ZI] <sub>sov</sub> = 1.36±0.05; Average soil depth = 41±3)  FR-2 0.93 39.6604 121.3607 0.7 0.48±0.03 1.59±0.07 25±4 1.13±0.07 0.77±0.01 156.7±25.2  FR-3 0.63 39.6363 121.2714 2.6 0.62±0.02 1.33±0.04 52±5 1.13±0.04 0.80±0.01 1219.5±27.8  FR-5 0.60 39.6361 121.2714 2.6 0.62±0.02 1.33±0.04 52±5 1.13±0.04 0.80±0.01 131.2±3.7  FR-6 0.63 79.86365 121.3323 121.3321 17.8 0.42±0.03 1.36±0.05 N.D. 1.12±0.05 0.89±0.01 134.1±6.4  FR-7 0.89 39.6391 121.3311 92.9 0.17±0.01 N.D. 41±3 1.13±0.07 0.98±0.00 31.0±6.0  FR-8 1.06 39.6556 121.3230 2.2 0.18±0.01 N.D. 41±3 1.13±0.07 0.98±0.00 31.0±6.0  FR-9 1.04 39.6552 121.33269 0.4 0.16±0.01 N.D. 10±5 1.04±0.07 0.98±0.00 14.4±1.6  FR-10 0.98 39.6465 121.3434 0.4 0.18±0.01 1.00±0.00 0 1.00±0.00 0.98±0.00 14.4±1.6  FR-10 1.09±0.00 (Map = Storite & Soapstone Hill; Assumed [ZI] <sub>sov</sub> [ZI] <sub>sov</sub> = 1.36±0.05; Assumed soil depth = 40±5)##  GD-1 1.41 39.8815 121.3468 1.1 0.67±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 38.6±11.3  GD-3 1.39 39.8804 121.33479 1.5 0.61±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 38.6±11.3  GD-3 1.52 39.8883 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 88.6±11.3  GD-4 1.52 39.8885 121.3363 1.9 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-5 1.50 39.8883 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-6 1.50 39.8885 121.3163 1.9 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-1 1.60 39.8884 121.3306 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-1 1.00 39.8884 121.3307 102.2 0.55±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-1 1.00 39.8885 121.3163 83.6 0.55±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 68.3±7.9  GD-1 1.00 39.8885 121.3163 83.6 0.55±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 57.3±8.4  GD-1 1.00 39.8884 121.3307 102.2 0.55±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 117.215.6  GD-1 1.00 39.8894 121.3891 121.3526 99.2 0.55±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 115.215.6  GD-1 1.00 39.8894 121.3891 121.3526 99.2 0.55±0.05 N.D. N.D. 1.12±0.05 0.89±0.03 10.52±15.0  Anielope Lake (Map = Kettle Rock; Average [ZI] <sub></sub>		Altitude	e Lat			gradient*	$[Zr]_{rock}$	depth§	factor#	factor**	rate††
FR-2		(km)	(° N)	(° W)	(ha)	(m/m)		(cm)			(mm/k.y.)
FR-2	Fall River	(Map =	Brush Cre	ek; Average	e [Zr] <sub>soil</sub> /	[Zr] <sub>rock</sub> = 1.36	6±0.05; Ave	rage soil	depth = 41±	3)	
FR-6			•								156.7±25.2
Fig. 1	FR-4	0.53	39.6350	121.2783	7.4	0.70±0.02	N.D.	38±1			
Fig.	FR-5	0.60	39.6361	121.2714	2.6	0.62±0.02	1.33±0.04	52±5	1.13±0.04	0.80±0.01	111.2±13.7
FR-8	FR-6	0.87	39.6385	121.3322	17.8	0.42±0.03	1.36±0.05	N.D.	1.12±0.05	0.89±0.01	34.1±6.4
FR-9		0.89	39.6391	121.3311				41±3	1.13±0.07	0.98±0.00	31.0±8.0
Grizzy Dome   Map = Storrie & Soapston   Hill;   Assumed   Zripon   Zripon   1.06±0.00   0.10.0±0.00   0.98±0.00   24.7±2.1						0.18±0.01	1.33±0.06	10±5		0.98±0.00	
Grizzly Dome (Map = Storrie & Soapstone Hill; Assumed [Zf] <sub>pow</sub> (Zf] <sub>pock</sub> = 1.36±0.05; Assumed soil depth = 40±5)##   GD-1							N.D.		1.04±0.07	0.98±0.00	18.2±2.6
GD-1 1.41 39.8815 121.3468 1.1 0.67±0.05 N.D. N.D. 1.12±0.05 0.78±0.03 130.9±18.9 GD-2 1.40 39.8811 121.3473 1.1 0.59±0.05 N.D. N.D. 1.12±0.05 0.82±0.03 86.4±11.3 GD-3 1.39 39.8804 121.3479 1.5 0.61±0.05 N.D. N.D. 1.12±0.05 0.81±0.03 85.7±11.8 GD-4 1.52 39.8861 121.3308 5.2 0.16±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 63.3±7.9 GD-5 1.50 39.8863 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8863 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8862 121.363 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3163 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3163 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.89±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3616 3.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.89±0.01 573±8.4 GD-10 1.00 39.8694 121.3691 78.0 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.89±0.01 573±8.4 GD-12 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 39.5±15.3 GD-12 0.99 39.8861 121.3566 99.2 0.54±0.05 N.D. N.D. 1.12±0.05 0.83±0.03 117.7±15.6 GD-14 1.08 39.8631 121.3526 99.2 0.54±0.05 N.D. N.D. 1.12±0.05 0.83±0.03 105.2±15.0 Antelope Lake (Map = Kettle Rock; Average [Zf] <sub>self</sub> (Zf] <sub>gock</sub> = 1.22±0.04; Average soil depth = 49±8)  AL-2 1.79 40.1721 120.6464 3.0 0.35±0.06 N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 AL-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.92±0.02 34.6±4.3 AL-5 1.69 40.1785 120.6382 1.9 0.43±0.01 2.60±0.06 N.D. 1.10±0.06 0.89±0.01 23.0±3.2 AL-5 1.69 40.1785 120.6382 1.9 0.43±0.01 2.60±0.06 N.D. 1.10±0.06 0.89±0.01 23.0±3.2 AL-5 1.69 40.1785 120.6382 1.9 0.43±0.01 2.60±0.08 N.D. 1.10±0.06 0.89±0.01 2.0±3.2 AL-5 1.69 40.1785 120.6382 1.9 0.43±0.01 3.60±0.04 N.D. 1.10±0.06 0.89±0.02 0.93±0.04 29.3±7.8 AL-6 1.75 40.1835 120.6384 2.6 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 N.D. 1.00±0.05 0.99±0.01 30.93±0.04 29.3±7.8 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.01 2.93±7.8 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.06±0.	FR-10	0.98	39.6465	121.3434	0.4	0.18±0.01	1.00±0.00	0	1.00±0.00	0.98±0.00	24.7±2.1
GD-2 1.40 39.8811 121.3473 1.1 0.59±0.05 N.D. N.D. 1.12±0.05 0.82±0.03 86.4±11.3 GD-3 1.39 39.8804 121.3479 1.5 0.61±0.05 N.D. N.D. N.D. 1.12±0.05 0.98±0.01 63.3±7.9 GD-5 1.50 39.8863 121.3308 5.2 0.16±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 63.2±7.4 GD-6 1.52 39.8882 121.3269 8.2 0.17±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8882 121.3269 8.2 0.17±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8883 121.3363 1.9 0.17±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3691 78.0 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 57.3±8.4 GD-10 1.00 39.8694 121.3691 78.0 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.89±0.03 31.5±15.3 GD-12 0.99 39.8885 121.3607 102.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 11.7±15.5 GD-13 0.99 39.8861 121.35607 102.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 11.7±15.5 GD-14 1.08 39.861 121.3562 99.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 105.2±15.0 N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 N.D. N.D. 1.08±0.04 0.96±0.01 23.0±3.2 N.D. N.D. 1.08±0.04 0.96±0.01 32.0±3.2 N.D. N.D. 1.06±0.03 0.99±0.00 30.6±3.7 N.D. N.D. 1.06±0.03 0.99±0.00 30.6±3.7 N.D.	Grizzly Do	me (Ma	p = Storrie	e & Soapsto	ne Hill;	Assumed [Z	r] <sub>soil</sub> /[Zr] <sub>rock</sub> =	= 1.36±0.	05; Assumed	d soil depth :	= 40±5)##
GD-3 1.39 39.8804 121.3479 1.5 0.61±0.05 N.D. N.D. 1.12±0.05 0.98±0.01 63.3±7.9 GD-5 1.50 39.8863 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.98±0.01 60.2±7.4 GD-6 1.52 39.8863 121.305 1.0 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8863 121.3636 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3669 1.80 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 77.3±8.4 GD-10 1.00 39.8694 121.3661 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 77.3±8.4 GD-12 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-13 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-13 0.99 39.8861 121.3662 99.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 105.2±15.0 Antelope Lake (Map = Kettle Pock; Average [Zf] <sub>sov</sub> /[Zf] <sub>mock</sub> = 1.2±0.04; Average soil depth = 49±8)  AL-2 1.79 40.1721 120.6464 30. 0.35±0.06 N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 AL-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.92±0.02 34.6±4.3 AL-4 1.74 40.1775 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. 1.10±0.06 0.89±0.00 38.4±5.9 AL-4 1.74 40.1775 120.6384 2.6 0.26±0.02 N.D. N.D. 1.10±0.06 0.89±0.00 38.4±5.9 AL-6 1.75 40.1835 120.6384 2.6 0.26±0.02 N.D. N.D. 1.08±0.04 0.96±0.01 23.0±3.2 AL-5 1.80 40.1546 120.6450 1.1 0.60±0.13 1.33±0.11 N.D. 1.13±0.11 0.82±0.04 0.96±0.02 20.7±2.7 AL-11 1.73 40.1628 120.6376 11.1 0.40±0.06 N.D. N.D. 1.08±0.04 0.96±0.02 161.±2.1 AL-8 1.76 40.1494 120.6472 111.5 0.50±0.02 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.03 0.88±0.01 30.6±3.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.03 0.96±0.00 30.6±3.7 AL-11 1.79 39.8987 120.1351 1.1 0.40±0.03 0.7±0.05 N.D. 1.06±0.03 0.99±0.00 30.6±3.7 AL-11 1.79 39.8987 120.1351 1.1 0.40±0.03 0.05±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 32.0±4.6 AP-9	GD-1	1.41	39.8815	121.3468	1.1	0.67±0.05	N.D.	N.D.	1.12±0.05	0.78±0.03	130.9±18.9
GD-4 1.52 39.8861 121.3308 5.2 0.16e.0.05 N.D. N.D. 1.12±0.05 0.98±0.01 63.3±7.9 GD-5 1.50 39.8863 121.3305 1.1 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8862 121.3689 8.2 0.17±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8862 121.3681 78.0 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3613 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.89±0.01 39.3±16.3 GD-12 0.99 39.8885 121.3607 102.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.80±0.03 39.5±16.3 GD-12 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-13 0.99 39.8861 121.3656 89.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 182±11.7 GD-14 1.08 39.8631 121.3656 89.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 105.2±15.0 Antelope Lake (Map = Kettle Rock; Average [Zr] <sub>sov</sub> /[Zr] <sub>prock</sub> = 1.22±0.04; Average soil depth = 49±8)  AL-2 1.79 40.1721 120.6454 3.0 0.35±0.06 N.D. N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 AL-3 1.74 40.1875 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. N.D. 1.08±0.04 0.89±0.00 38.4±5.9 AL-4 1.74 40.1775 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. N.D. 1.08±0.04 0.89±0.01 23.0±3.2 AL-5 1.69 40.1785 120.6288 4.5 0.34±0.10 1.36±0.24 N.D. 1.14±0.24 0.93±0.04 2.93±7.8 AL-6 1.75 40.1835 120.6534 2.6 0.26±0.02 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-7 1.80 40.1623 120.6532 3.3 0.27±0.06 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-8 1.76 40.1494 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.02 30.6±3.7 AL-11 1.73 40.1548 120.6336 3.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AL-10 1.80 40.1548 120.6376 11.1 0.40±0.06 1.21±0.02 53±7 1.09±0.02 0.90±0.03 30.6±3.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.06±0.03 0.97±0.01 34.1±4.1 AP-2 2.15 39.9032 120.1351 3.3 0.46±0.03 1.24±0.03 2.7±9 1.06±0.03 0.98±0.01 36.6±4.1 AP-3 2.14 39.8987 120.1351 3.3 0.46±0.03 1.24±0.03 2.7±9 1.06±0.03 0.98±0.01 30.6±4.1 AP-3 2.14 39.8987 120.1351 3.3 0.46±0.03 N.D. N.D. 1.06±0.03 0.99±0.00 30.6±4.6 AP-9 1.94 39.8828 120.1278 0.7 0.40±0.05 N.D. N.D. 1.06±0.03 0.99±0.00	GD-2	1.40	39.8811	121.3473	1.1	0.59±0.05	N.D.	N.D.	1.12±0.05	0.82±0.03	
GD-5 1.50 39.8863 121.3305 1.1 0.13±0.05 N.D. N.D. 1.12±0.05 0.99±0.01 60.2±7.4 GD-6 1.52 39.8865 121.3163 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3163 1.9 0.13±0.05 N.D. N.D. N.D. 1.12±0.05 0.99±0.01 57.3±8.4 GD-10 1.00 39.8694 121.3691 78.0 0.63±0.05 N.D. N.D. N.D. 1.12±0.05 0.80±0.03 93.5±15.3 GD-12 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.80±0.03 111.7±15.0 GD-14 1.08 39.8631 121.3526 99.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.0 GD-14 1.08 39.8631 121.3526 99.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 182±11.7 GD-14 1.08 39.8631 121.3526 99.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 105.2±15.0 Antelope Lake (Map = Kettle Rock; Average [Zf] <sub>sov</sub> /[Zf] <sub>pock</sub> = 1.22±0.04; Average soil depth = 49±8)  AL-2 1.79 40.1721 120.6484 3.0 0.35±0.06 N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 AL-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.89±0.00 38.4±5.9 AL-4 1.74 40.1775 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. 1.10±0.06 0.89±0.01 32.0±3.2 AL-5 1.69 40.1785 120.6288 4.5 0.34±0.10 1.36±0.24 N.D. 1.14±0.24 0.93±0.04 29.3±7.8 AL-6 1.75 40.1835 120.6384 2.6 0.26±0.02 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-7 1.80 40.1546 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-7 1.80 40.1546 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.01 28.2±5.1 AL-9 1.80 40.1548 120.6376 11.1 0.60±0.13 1.33±0.11 N.D. 1.08±0.04 0.96±0.02 20.7±2.7 Adams Peak (Map = Constantia; Average [Zf] <sub>sov</sub> /[Zf] <sub>cock</sub> = 1.20±0.03; Average soil depth = 34±5)  AP-1 2.05 39.9032 120.1286 2.2 0.22±0.05 N.D. N.D. 1.06±0.03 0.88±0.01 36.7±4.4 AP-3 2.14 39.8987 120.1339 7.4 0.3±0.04 0.3±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 30.6±3.7 AP-4 2.19 39.8877 120.1499 1.9 0.67±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 54.6±7.4 AP-6 2.12 39.8874 120.1339 7.4 0.3±0.04 0.3±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 54.6±7.4 AP-6 2.12 39.8874 120.1339 7.4 0.3±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 54.6±7.4 AP-1 1.2.5 39.8917 120.1499 1.9 0.67±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 52		1.39	39.8804	121.3479		0.61±0.05	N.D.	N.D.	1.12±0.05	0.81±0.03	
GD-6 1.52 39.8862 121.3269 8.2 0.17±0.05 N.D. N.D. 1.12±0.05 0.98±0.01 70.9±9.0 GD-9 1.51 39.8865 121.3163 1.9 0.13±0.05 N.D. N.D. 1.12±0.05 0.89±0.01 57.3±8.4 GD-10 1.00 39.6694 121.3691 78.0 0.63±0.05 N.D. N.D. 1.12±0.05 0.80±0.03 93.5±15.3 GD-12 0.99 39.8885 121.3607 102.2 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-13 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-14 1.08 39.8631 121.3526 99.2 0.54±0.05 N.D. N.D. N.D. 1.12±0.05 0.84±0.03 105.2±15.0 Antelope Lake (Map = Kettle Rock; Average [Zf] <sub>sov</sub>  [Zf] <sub>pock</sub> = 1.22±0.04; Average soil depth = 49±8)  Al-2 1.79 40.1721 120.6464 3.0 0.35±0.06 N.D. N.D. 1.08±0.04 0.92±0.02 34.6±4.3 Al-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.89±0.01 38.4±5.9 Al-4 1.74 40.1775 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. 1.10±0.06 0.89±0.01 23.0±3.2 Al-5 1.69 40.1785 120.6288 4.5 0.34±0.10 1.36±0.24 N.D. 1.10±0.06 0.89±0.01 23.0±3.2 Al-6 1.75 40.1835 120.6384 2.6 0.26±0.02 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 Al-7 1.80 40.1623 120.6532 3.3 0.27±0.06 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 Al-7 1.80 40.1546 120.6450 1.1 0.60±0.13 1.33±0.11 N.D. 1.13±0.04 0.96±0.02 16.1±2.1 Al-8 1.76 40.1494 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.02 16.1±2.1 Al-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 Adams Peak (Map = Constantia; Average [Zf] <sub>sov</sub> /[Zf] <sub>cock</sub> = 1.20±0.03; Average soil depth = 34±5)  AP-1 2.05 39.9032 120.1351 1.1 0.40±0.06 1.21±0.02 53±7 1.09±0.02 0.90±0.03 30.6±3.7 Al-11 1.73 40.1628 120.1339 7.4 0.34±0.04 N.D. 1.06±0.03 0.97±0.01 34.1±4.1 AP-2 2.15 39.9032 120.1351 1.1 0.40±0.06 N.D. N.D. 1.06±0.03 0.97±0.01 34.1±4.1 AP-2 1.9 39.8987 120.1351 1.1 0.40±0.06 N.D. N.D. 1.06±0.03 0.97±0.01 34.1±4.1 AP-2 1.9 39.8987 120.1351 1.1 0.40±0.06 N.D. N.D. 1.06±0.03 0.99±0.02 54.6±7.4 AP-13 1.89 39.8081 120.1339 7.4 0.34±0.04 N.D. N.D. 1.06±0.03 0.99±0.03 30.6±3.7 AP-14 1.89 39.8878 120.1359 1.3 0.40±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 50.2±6.2 AP-13 1.89 39.8802 120.1278 0.	GD-4	1.52	39.8861	121.3308	5.2	0.16±0.05	N.D.	N.D.	1.12±0.05	0.98±0.01	63.3±7.9
GD-9	GD-5	1.50	39.8863	121.3305		0.13±0.05	N.D.	N.D.	1.12±0.05	0.99±0.01	60.2±7.4
GD-10	GD-6	1.52	39.8882	121.3269		0.17±0.05		N.D.	1.12±0.05	0.98±0.01	70.9±9.0
GD-12 0.99 39.8865 121.3607 102.2 0.55±0.05 N.D. N.D. 1.12±0.05 0.83±0.03 111.7±15.6 GD-13 0.99 39.8861 121.3616 83.6 0.55±0.05 N.D. N.D. 1.12±0.05 0.83±0.03 88.2±11.7 GD-14 1.08 39.8631 121.3526 99.2 0.54±0.05 N.D. N.D. 1.12±0.05 0.83±0.03 88.2±11.7 N.D. 1.08±0.04 0.84±0.03 105.2±15.0 AL-2 1.79 40.1721 120.6464 3.0 0.35±0.06 N.D. N.D. 1.08±0.04 0.89±0.02 34.6±4.3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.89±0.00 38.4±5.9 AL-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.89±0.01 23.0±3.2 AL-5 1.69 40.1785 120.6388 4.5 0.34±0.10 1.36±0.24 N.D. 1.14±0.24 0.93±0.04 29.3±7.8 AL-6 1.75 40.1835 120.6384 2.6 0.26±0.06 N.D. N.D. 1.08±0.04 0.96±0.01 23.0±3.2 AL-7 1.80 40.1623 120.6532 3.3 0.27±0.06 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-7 1.80 40.1646 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.02 16.1±2.1 AL-8 1.76 40.1494 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.02 16.1±2.1 AL-9 1.80 40.1546 120.6450 1.1 0.60±0.13 1.33±0.11 N.D. 1.13±0.11 0.82±0.07 36.7±6.7 AL-10 1.80 40.1548 120.6376 11.1 0.60±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 Adams Peak (Map = Constantia; Average [Zr]sol/(Zr]cock = 1.20±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AA-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 AP-6 2.12 39.9023 120.1351 1.1 0.40±0.06 1.21±0.02 53±7 1.09±0.02 0.90±0.03 30.6±4.1 AP-3 2.14 39.8997 120.1409 1.9 0.67±0.05 N.D. N.D. 1.06±0.03 0.88±0.01 36.7±4.4 AP-3 2.14 39.8997 120.1409 1.9 0.67±0.05 N.D. N.D. 1.06±0.03 0.99±0.03 30.6±4.1 AP-5 2.05 39.8904 120.1339 7.4 0.34±0.04 N.D. N.D. 1.06±0.03 0.91±0.01 52.5±6.6 AP-7 1.92 39.8828 120.1278 1.1 0.38±0.03 N.D. N.D. 1.06±0.03 0.91±0.01 52.5±6.6 AP-7 1.92 39.8828 120.1278 1.1 0.38±0.03 N.D. N.D. 1.06±0.03 0.91±0.01 52.5±6.6 AP-7 1.92 39.8828 120.1278 0.7 0.25±0.05 N.D. N.D. 1.06±0.03 0.91±0.01 52.5±6.6 AP-13 1.89 39.8802 120.1278 0.7 0.25±0.05 N.D. N.D. 1.06±0.03 0.91±0.01 52.5±6.6 AP-13 1.89 39.8802 120.1278 0.7 0.25±0.05 N.D. N.D. 1.06±0.03 0.99±0.00 32.04.6 SP-3 2.33 35.7981 118.5833 5.6 0	GD-9	1.51	39.8865	121.3163	1.9	0.13±0.05	N.D.	N.D.			57.3±8.4
GD-13			39.8694			0.63±0.05				0.80±0.03	93.5±15.3
Antelope Lake (Map = Kettle Rock; Average  Zr scoll  Zr rock = 1.22±0.04; Average  soil depth = 49±8    Al-2   1.79   40.1721   120.6464   3.0   0.35±0.06   N.D.   N.D.   1.08±0.04   0.92±0.02   34.6±4.3   Al-3   1.74   40.1801   120.6368   8.2   0.42±0.01   N.D.   N.D.   1.08±0.04   0.92±0.02   34.6±4.3   Al-4   1.74   40.1775   120.6362   1.9   0.43±0.02   1.26±0.06   N.D.   1.10±0.06   0.89±0.01   23.0±3.2   Al-5   1.69   40.1785   120.6382   1.9   0.43±0.02   1.26±0.06   N.D.   1.10±0.06   0.89±0.01   23.0±3.2   Al-5   1.69   40.1785   120.6384   2.6   0.26±0.02   N.D.   N.D.   1.08±0.04   0.93±0.04   29.3±7.8   Al-6   1.75   40.1835   120.6532   3.3   0.27±0.06   N.D.   N.D.   1.08±0.04   0.95±0.02   16.1±2.1   Al-9   1.80   40.1546   120.6472   111.5   0.50±0.20   N.D.   N.D.   1.08±0.04   0.95±0.02   16.1±2.1   Al-9   1.80   40.1546   120.6450   1.1   0.60±0.03   1.33±0.11   N.D.   1.13±0.11   0.82±0.07   36.7±6.7   Al-10   1.80   40.1546   120.6376   11.1   0.40±0.06   1.21±0.02   53±7   1.09±0.02   0.90±0.03   30.6±3.7   Al-11   1.73   40.1628   120.6338   52.0   0.26±0.05   N.D.   N.D.   1.06±0.03   0.97±0.01   34.1±4.1   AP-3   2.15   39.9032   120.1356   2.2   0.22±0.05   N.D.   N.D.   1.06±0.03   0.97±0.01   34.1±4.1   AP-3   2.14   39.8987   120.1351   3.3   0.46±0.03   1.24±0.03   2.7±9   1.06±0.03   0.88±0.01   45.6±5.8   AP-4   2.19   39.8917   120.1409   1.9   0.67±0.05   N.D.   N.D.   1.06±0.03   0.88±0.01   45.6±5.8   AP-7   1.92   39.8828   120.1351   3.1   0.45±0.05   N.D.   N.D.   1.06±0.03   0.88±0.01   45.6±5.8   AP-7   1.92   39.8828   120.1375   3.1   0.40±0.06   N.D.   N.D.   1.06±0.03   0.93±0.03   30.6±4.1   AP-5   2.05   39.8904   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.93±0.03   30.6±4.1   AP-9   39.8828   120.1278   1.1   0.40±0.05   N.D.   N.D.   1.06±0.03   0.93±0.01   45.6±5.8   AP-7   1.92   39.8828   120.1278   1.1   0.38±0.03   N.D.   N.D.   1.06±0.03   0.93±0.00   50.2±6.2   AP-11   2.25   39.8917   120.1409   1.9   0.67±0.05   N.D.   N.D.   1.06±0						0.55±0.05		N.D.	1.12±0.05	0.83±0.03	111.7±15.6
Antelope Lake (Map = Kettle Rock; Average   Z r soll/ Z r rock = 1.22±0.04; Average soil depth = 49±8)   Al2   1.79   40.1721   120.6464   3.0   0.35±0.06   N.D.   N.D.   1.08±0.04   0.92±0.02   34.6±4.3   Al3   1.74   40.1801   120.6368   8.2   0.42±0.01   N.D.   45±16   1.08±0.04   0.89±0.00   38.4±5.9   Al4   1.74   40.1775   120.6382   1.9   0.43±0.02   1.26±0.06   N.D.   1.10±0.06   0.89±0.01   32.0±3.2   Al5   1.69   40.1785   120.6288   4.5   0.34±0.10   1.36±0.24   N.D.   1.14±0.24   0.93±0.04   29.3±7.8   Al6   1.75   40.1835   120.6384   2.6   0.26±0.02   N.D.   N.D.   1.08±0.04   0.96±0.01   24.3±2.9   Al7   1.80   40.1623   120.6532   3.3   0.27±0.06   N.D.   N.D.   1.08±0.04   0.96±0.01   24.3±2.9   Al8   1.76   40.1494   120.6472   111.5   0.50±0.20   N.D.   N.D.   1.08±0.04   0.96±0.01   28.2±5.1   Al9   1.80   40.1546   120.6450   1.1   0.60±0.13   1.33±0.11   N.D.   1.13±0.11   0.82±0.07   36.7±6.7   Al10   1.80   40.1548   120.6376   1.1   0.40±0.06   1.21±0.02   53±7   1.09±0.02   0.90±0.03   30.6±3.7   Al11   1.73   40.1628   120.6338   52.0   0.26±0.05   N.D.   N.D.   1.08±0.04   0.96±0.02   20.7±2.7   Adams Peak (Map = Constantia; Average   Z r soll/ Z r cck = 1.20±0.03; Average soil depth = 34±5)   AP-2   2.15   39.9023   120.1351   3.3   0.46±0.03   1.24±0.03   27±9   1.06±0.03   0.88±0.01   36.7±4.4   AP-3   2.14   39.8987   120.1351   3.3   0.46±0.03   1.24±0.03   27±9   1.06±0.03   0.88±0.01   36.7±4.4   AP-5   2.05   39.8904   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.97±0.01   34.1±4.1   AP-6   2.12   39.8874   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.99±0.02   54.6±7.4   AP-6   2.12   39.8874   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.99±0.00   54.6±7.4   AP-6   2.12   39.8874   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.99±0.00   54.6±7.4   AP-6   2.12   39.8874   120.1339   7.4   0.34±0.04   1.15±0.06   N.D.   1.06±0.03   0.99±0.00   54.6±7.4   AP-13   1.89   39.8802   120.1278											
Al-2	GD-14	1.08	39.8631	121.3526	99.2	0.54±0.05	N.D.	N.D.	1.12±0.05	0.84±0.03	105.2±15.0
AL-3 1.74 40.1801 120.6368 8.2 0.42±0.01 N.D. 45±16 1.08±0.04 0.89±0.00 38.4±5.9 AL-4 1.74 40.1775 120.6382 1.9 0.43±0.02 1.26±0.06 N.D. 1.10±0.06 0.89±0.01 23.0±3.2 AL-5 1.69 40.1785 120.6288 4.5 0.34±0.10 1.36±0.24 N.D. 1.14±0.24 0.93±0.04 29.3±7.8 AL-6 1.75 40.1835 120.6384 2.6 0.26±0.02 N.D. N.D. 1.08±0.04 0.96±0.01 24.3±2.9 AL-7 1.80 40.1623 120.6532 3.3 0.27±0.06 N.D. N.D. 1.08±0.04 0.96±0.02 16.1±2.1 AL-8 1.76 40.1494 120.6472 111.5 0.50±0.20 N.D. N.D. 1.08±0.04 0.96±0.02 16.1±2.1 AL-9 1.80 40.1546 120.6450 1.1 0.60±0.13 1.33±0.11 N.D. 1.13±0.11 0.82±0.07 36.7±6.7 AL-10 1.80 40.1546 120.6450 1.1 0.60±0.13 1.33±0.11 N.D. 1.13±0.11 0.82±0.07 36.7±6.7 AL-11 1.73 40.1628 120.6338 52.0 0.26±0.05 N.D. N.D. N.D. 1.08±0.04 0.96±0.02 20.7±2.7 Adams Peak (Map = Constantia; Average [Zr] <sub>soll</sub> /[Zr] <sub>rock</sub> = 1.20±0.03; Average soil depth = 34±5)  AP-1 2.05 39.9023 120.1286 2.2 0.22±0.05 N.D. N.D. 1.06±0.03 0.97±0.01 34.1±4.1 AP-3 2.14 39.8987 120.1351 1.1 0.45±0.02 N.D. N.D. 1.06±0.03 0.88±0.01 36.7±4.4 AP-3 2.14 39.8987 120.1351 1.3 0.46±0.03 1.24±0.03 27±9 1.06±0.03 0.88±0.01 36.7±4.4 AP-3 2.14 39.8987 120.1351 3.3 0.46±0.03 1.24±0.03 27±9 1.06±0.03 0.88±0.01 36.7±4.4 AP-5 2.05 39.8904 120.1339 7.4 0.34±0.04 1.15±0.06 N.D. 1.04±0.06 0.93±0.02 54.6±7.4 AP-6 2.12 39.8874 120.1339 7.4 0.34±0.04 1.15±0.06 N.D. 1.06±0.03 0.93±0.02 54.6±7.4 AP-6 2.12 39.8874 120.1339 13.4 0.49±0.06 N.D. N.D. 1.06±0.03 0.93±0.02 54.6±7.4 AP-13 1.89 39.8828 120.1278 1.1 0.38±0.03 N.D. N.D. 1.06±0.03 0.93±0.00 54.6±7.4 AP-13 1.89 39.8828 120.1278 1.1 0.38±0.03 N.D. N.D. 1.06±0.03 0.93±0.00 54.6±7.4 AP-13 1.89 39.8828 120.1278 0.7 0.26±0.01 N.D. N.D. 1.06±0.03 0.93±0.00 50.2±6.2 AP-11 2.25 39.8917 120.1443 0.4 0.10±0.01 1.22±0.05 N.D. 1.06±0.03 0.93±0.00 50.2±6.2 AP-11 2.25 39.8917 120.1443 0.4 0.10±0.01 1.22±0.05 N.D. 1.06±0.03 0.93±0.00 50.2±6.2 AP-11 2.25 39.8917 120.1443 0.4 0.10±0.01 1.22±0.05 N.D. 1.06±0.03 0.93±0.00 32.0±6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>soll</sub> /[Zr] <sub>rock</sub> = 1.11±0.05; Average soil depth = 61±12) SP-1 2.27	Antelope l	_ake (M	ap = Kettle	e Rock; Ave	rage [Z	$r]_{soil}/[Zr]_{rock} =$	1.22±0.04;	Average	soil depth =	49±8)_	
AL-4 1.74 40.1775 120.6382 1.9 0.43 $\pm$ 0.02 1.26 $\pm$ 0.06 N.D. 1.10 $\pm$ 0.06 0.89 $\pm$ 0.01 23.0 $\pm$ 3.2 AL-5 1.69 40.1785 120.6288 4.5 0.34 $\pm$ 0.10 1.36 $\pm$ 0.24 N.D. 1.14 $\pm$ 0.24 0.93 $\pm$ 0.04 29.3 $\pm$ 7.8 AL-6 1.75 40.1835 120.6582 3.3 0.27 $\pm$ 0.06 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.01 24.3 $\pm$ 2.9 AL-7 1.80 40.1623 120.6532 3.3 0.27 $\pm$ 0.06 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.01 24.3 $\pm$ 2.9 AL-7 1.80 40.1623 120.6532 3.3 0.27 $\pm$ 0.06 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.01 24.3 $\pm$ 2.9 AL-7 1.80 40.1623 120.6532 11.5 0.50 $\pm$ 0.20 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.01 28.2 $\pm$ 5.1 AL-8 1.76 40.1494 120.6472 111.5 0.50 $\pm$ 0.20 N.D. N.D. 1.08 $\pm$ 0.04 0.86 $\pm$ 0.10 28.2 $\pm$ 5.1 AL-9 1.80 40.1548 120.6376 11.1 0.40 $\pm$ 0.06 1.21 $\pm$ 0.02 53 $\pm$ 7 1.09 $\pm$ 0.02 0.90 $\pm$ 0.03 30.6 $\pm$ 3.7 AL-11 1.73 40.1628 120.6376 11.1 0.40 $\pm$ 0.06 1.21 $\pm$ 0.02 53 $\pm$ 7 1.09 $\pm$ 0.02 0.90 $\pm$ 0.03 30.6 $\pm$ 3.7 AL-11 1.73 40.1628 120.1351 1.1 0.45 $\pm$ 0.02 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.02 20.7 $\pm$ 2.7 Adams Peak (Map = Constantia; Average [Zr] <sub>sol</sub> /[Zr] <sub>rock</sub> = 1.20 $\pm$ 0.03; Average soil depth = 34 $\pm$ 5)  AP-1 2.05 39.9032 120.1286 2.2 0.22 $\pm$ 0.05 N.D. N.D. 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 34.1 $\pm$ 4.1 AP-2 2.15 39.9023 120.1351 3.3 0.46 $\pm$ 0.03 1.24 $\pm$ 0.03 27 $\pm$ 9 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 36.7 $\pm$ 4.4 AP-3 2.14 39.8987 120.1351 3.3 0.46 $\pm$ 0.03 1.24 $\pm$ 0.03 27 $\pm$ 9 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 45.6 $\pm$ 5.8 AP-4 2.19 39.8917 120.1409 1.9 0.67 $\pm$ 0.05 1.09 $\pm$ 0.05 N.D. 1.03 $\pm$ 0.05 0.78 $\pm$ 0.03 30.6 $\pm$ 4.1 AP-5 2.05 39.8904 120.1339 7.4 0.34 $\pm$ 0.04 1.15 $\pm$ 0.06 N.D. 1.04 $\pm$ 0.06 0.93 $\pm$ 0.02 54.6 $\pm$ 7.4 AP-6 2.12 39.8828 120.1278 1.1 0.38 $\pm$ 0.03 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.01 45.6 $\pm$ 5.8 AP-7 1.92 39.8828 120.1278 1.1 0.38 $\pm$ 0.01 N.D. N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 50.2 $\pm$ 6.2 AP-11 2.25 39.8817 120.1443 0.4 0.10 $\pm$ 0.10 N.D. N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 50.2 $\pm$ 6.2 AP-11 2.25 39.8817 120.1278 0.7 0.26 $\pm$ 0.01 N.D. N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 49.8 $\pm$ 6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>sol</sub> /[Zr] <sub>rock</sub> = 1.11 $\pm$ 0.05; Average soil depth = 61 $\pm$ 12) SP-1 2.27 35.7839 118.5833 5.6 0.45 $\pm$ 0.05 1.03 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.06 0.84 $\pm$ 0.03 4		1.79	40.1721	120.6464	3.0	0.35±0.06		N.D.		0.92±0.02	34.6±4.3
AL-5								45±16			
AL-6 1.75 40.1835 120.6384 2.6 0.26 $\pm$ 0.02 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.01 24.3 $\pm$ 2.9 AL-7 1.80 40.1623 120.6532 3.3 0.27 $\pm$ 0.06 N.D. N.D. 1.08 $\pm$ 0.04 0.95 $\pm$ 0.02 16.1 $\pm$ 2.1 AL-8 1.76 40.1494 120.6472 1111.5 0.50 $\pm$ 0.20 N.D. N.D. 1.08 $\pm$ 0.04 0.86 $\pm$ 0.10 28.2 $\pm$ 5.1 AL-9 1.80 40.1546 120.6450 1.1 0.60 $\pm$ 0.13 1.33 $\pm$ 0.11 N.D. 1.13 $\pm$ 0.11 0.82 $\pm$ 0.07 36.7 $\pm$ 6.7 AL-10 1.80 40.1548 120.6376 11.1 0.40 $\pm$ 0.06 1.21 $\pm$ 0.02 53 $\pm$ 7 1.09 $\pm$ 0.02 0.90 $\pm$ 0.03 30.6 $\pm$ 3.7 AL-11 1.73 40.1628 120.6338 52.0 0.26 $\pm$ 0.05 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.02 20.7 $\pm$ 2.7 Adams Peak (Map = Constantia; Average [Zr] <sub>Sol</sub> /(Zr] <sub>rock</sub> = 1.20 $\pm$ 0.03; Average soil depth = 34 $\pm$ 5)  AP-1 2.05 39.9023 120.1351 1.1 0.45 $\pm$ 0.02 N.D. N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 34.1 $\pm$ 4.1 AP-2 2.15 39.9023 120.1351 1.1 0.45 $\pm$ 0.02 N.D. N.D. 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 36.7 $\pm$ 4.4 AP-3 2.14 39.8987 120.1351 3.3 0.46 $\pm$ 0.05 1.24 $\pm$ 0.05 N.D. 1.03 $\pm$ 0.05 0.78 $\pm$ 0.03 30.64 $\pm$ 1. AP-5 2.05 39.8904 120.1339 7.4 0.34 $\pm$ 0.05 1.09 $\pm$ 0.05 N.D. 1.03 $\pm$ 0.05 0.78 $\pm$ 0.03 30.64 $\pm$ 1. AP-6 2.12 39.8874 120.1339 7.4 0.34 $\pm$ 0.04 1.15 $\pm$ 0.06 N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 30.64 $\pm$ 1. AP-6 2.12 39.8874 120.1339 13.4 0.49 $\pm$ 0.06 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 50.44.1 AP-6 2.12 39.8874 120.1339 13.4 0.49 $\pm$ 0.06 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 50.44.1 AP-6 2.12 39.8874 120.1339 13.4 0.49 $\pm$ 0.06 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 50.44.1 AP-6 2.12 39.8878 120.1278 1.1 0.38 $\pm$ 0.03 N.D. N.D. 1.06 $\pm$ 0.03 0.91 $\pm$ 0.05 50.25 $\pm$ 6. AP-7 1.92 39.8828 120.1278 0.4 0.34 $\pm$ 0.01 N.D. N.D. 1.06 $\pm$ 0.03 0.91 $\pm$ 0.05 50.25 $\pm$ 6. AP-11 2.25 39.8917 120.1443 0.4 0.10 $\pm$ 0.05 N.D. 1.06 $\pm$ 0.03 0.91 $\pm$ 0.01 50.25 $\pm$ 6. AP-11 2.25 39.8917 120.1443 0.4 0.10 $\pm$ 0.01 N.D. 37 $\pm$ 7 1.06 $\pm$ 0.03 0.97 $\pm$ 0.00 49.8 $\pm$ 6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>Sol</sub> /(Zr] <sub>Tock</sub> = 1.11 $\pm$ 0.05; Average soil depth = 61 $\pm$ 12) SP-1 2.27 35.7938 118.5839 5.6 0.45 $\pm$ 0.05 1.03 $\pm$ 0.08 N.D. 1.05 $\pm$ 0.00 0.94 $\pm$ 0.03 0.94 $\pm$ 0. S2 $\pm$ 1.8 SP-7 2.42 35.7830 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.03 50.7 $\pm$ 7.9 SP-8 2.42 35.7830 118.5											
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AL-11 1.73 40.1628 120.6338 52.0 0.26 $\pm$ 0.05 N.D. N.D. 1.08 $\pm$ 0.04 0.96 $\pm$ 0.02 20.7 $\pm$ 2.7 Adams Peak (Map = Constantia; Average [Zr] <sub>soll</sub> /[Zr] <sub>rock</sub> = 1.20 $\pm$ 0.03; Average soil depth = 34 $\pm$ 5)  AP-1 2.05 39.9032 120.1286 2.2 0.22 $\pm$ 0.05 N.D. N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 34.1 $\pm$ 4.1 AP-2 2.15 39.9023 120.1351 1.1 0.45 $\pm$ 0.02 N.D. N.D. 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 36.7 $\pm$ 4.4 AP-3 2.14 39.8987 120.1351 3.3 0.46 $\pm$ 0.03 1.24 $\pm$ 0.03 27 $\pm$ 9 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 45.6 $\pm$ 5.8 AP-4 2.19 39.8917 120.1409 1.9 0.67 $\pm$ 0.05 1.09 $\pm$ 0.05 N.D. 1.03 $\pm$ 0.05 0.78 $\pm$ 0.03 30.6 $\pm$ 4.1 AP-5 2.05 39.8904 120.1339 7.4 0.34 $\pm$ 0.04 1.15 $\pm$ 0.06 N.D. 1.04 $\pm$ 0.06 0.93 $\pm$ 0.02 54.6 $\pm$ 7.4 AP-6 2.12 39.8874 120.1339 13.4 0.49 $\pm$ 0.06 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 44.3 $\pm$ 5.6 AP-7 1.92 39.8828 120.1278 1.1 0.38 $\pm$ 0.03 N.D. N.D. 1.06 $\pm$ 0.03 0.91 $\pm$ 0.01 52.5 $\pm$ 6.6 AP-9 1.94 39.8828 120.1278 1.1 0.38 $\pm$ 0.03 N.D. N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 50.256.2 AP-11 2.25 39.8917 120.1443 0.4 0.10 $\pm$ 0.01 1.22 $\pm$ 0.05 N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 50.256.2 AP-13 1.89 39.8802 120.1275 0.4 0.21 $\pm$ 0.03 1.20 $\pm$ 0.03 N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 43.0 $\pm$ 5.3 AP-14 1.89 39.8787 120.1278 0.7 0.26 $\pm$ 0.01 N.D. 37 $\pm$ 7 1.06 $\pm$ 0.03 0.96 $\pm$ 0.00 49.8 $\pm$ 6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>soll</sub> /[Zr] <sub>rock</sub> = 1.11 $\pm$ 0.05; Average soil depth = 61 $\pm$ 12)  SP-1 2.27 35.7938 118.5839 5.6 0.45 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 28.2 $\pm$ 11.8 SP-7 2.42 35.789 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 28.2 $\pm$ 11.8 SP-7 2.42 35.789 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 282.8 $\pm$ 11.8 SP-7 2.42 35.7830 118.5915 2.2 0.21 $\pm$ 0.05 1.15 $\pm$ 0.06 N.D. 1.07 $\pm$ 0.06 0.97 $\pm$ 0.01 30.0 $\pm$ 4.0											
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$											
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AL-11	1.73	40.1628	120.6338	52.0	0.26±0.05	N.D.	N.D.	1.08±0.04	0.96±0.02	20.7±2.7
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Adams Pe	ak (Ma	p = Consta	antia; Avera		$_{\text{oil}}/[Zr]_{\text{rock}}=1.$			oil depth = 34	±5)	
AP-3 2.14 39.8987 120.1351 3.3 0.46 $\pm$ 0.03 1.24 $\pm$ 0.03 27 $\pm$ 9 1.06 $\pm$ 0.03 0.88 $\pm$ 0.01 45.6 $\pm$ 5.8 AP-4 2.19 39.8917 120.1409 1.9 0.67 $\pm$ 0.05 1.09 $\pm$ 0.05 N.D. 1.03 $\pm$ 0.05 0.78 $\pm$ 0.03 30.6 $\pm$ 4.1 AP-5 2.05 39.8904 120.1339 7.4 0.34 $\pm$ 0.04 1.15 $\pm$ 0.06 N.D. 1.04 $\pm$ 0.06 0.93 $\pm$ 0.02 54.6 $\pm$ 7.4 AP-6 2.12 39.8874 120.1339 13.4 0.49 $\pm$ 0.06 N.D. N.D. 1.06 $\pm$ 0.03 0.86 $\pm$ 0.03 44.3 $\pm$ 5.6 AP-7 1.92 39.8828 120.1278 1.1 0.38 $\pm$ 0.03 N.D. N.D. 1.06 $\pm$ 0.03 0.91 $\pm$ 0.01 52.5 $\pm$ 6.6 AP-9 1.94 39.8828 120.1298 0.4 0.34 $\pm$ 0.01 N.D. N.D. 1.06 $\pm$ 0.03 0.93 $\pm$ 0.00 50.2 $\pm$ 6.2 AP-11 2.25 39.8917 120.1443 0.4 0.10 $\pm$ 0.01 1.22 $\pm$ 0.05 N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 32.0 $\pm$ 4.6 AP-13 1.89 39.8802 120.1275 0.4 0.21 $\pm$ 0.03 1.20 $\pm$ 0.03 N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 43.0 $\pm$ 5.3 AP-14 1.89 39.8787 120.1278 0.7 0.26 $\pm$ 0.01 N.D. 37 $\pm$ 7 1.06 $\pm$ 0.03 0.96 $\pm$ 0.00 49.8 $\pm$ 6.6 SP-1 2.27 35.7938 118.5899 9.3 0.55 $\pm$ 0.05 1.12 $\pm$ 0.06 61 $\pm$ 12 1.05 $\pm$ 0.06 0.84 $\pm$ 0.03 40.2 $\pm$ 5.6 SP-3 2.33 35.7981 118.5833 5.6 0.45 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 30.0 $\pm$ 4.6 SP-4 2.27 35.8150 118.5754 1.1 0.29 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 82.8 $\pm$ 11.8 SP-7 2.42 35.7789 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.73 $\pm$ 0.03 50.7 $\pm$ 7.9 SP-8 2.42 35.7830 118.5915 2.2 0.21 $\pm$ 0.05 1.15 $\pm$ 0.06 N.D. 1.07 $\pm$ 0.06 0.97 $\pm$ 0.01 30.0 $\pm$ 4.0	AP-1	2.05	39.9032	120.1286	2.2	0.22±0.05	N.D.	N.D.	1.06±0.03	0.97±0.01	34.1±4.1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	AP-2	2.15									–
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	AP-3	2.14	39.8987	120.1351	3.3	0.46±0.03	1.24±0.03	27±9	1.06±0.03	0.88±0.01	45.6±5.8
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	AP-4	2.19	39.8917	120.1409	1.9	0.67±0.05	1.09±0.05	N.D.	1.03±0.05	0.78±0.03	30.6±4.1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	AP-5	2.05	39.8904	120.1339	7.4	0.34±0.04	1.15±0.06	N.D.	1.04±0.06	0.93±0.02	54.6±7.4
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		2.12	39.8874	120.1339	13.4	0.49±0.06		N.D.		0.86±0.03	44.3±5.6
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					1.1	$0.38 \pm 0.03$		N.D.			
AP-13 1.89 39.8802 120.1275 0.4 0.21 $\pm$ 0.03 1.20 $\pm$ 0.03 N.D. 1.06 $\pm$ 0.03 0.97 $\pm$ 0.01 43.0 $\pm$ 5.3 AP-14 1.89 39.8787 120.1278 0.7 0.26 $\pm$ 0.01 N.D. 37 $\pm$ 7 1.06 $\pm$ 0.03 0.96 $\pm$ 0.00 49.8 $\pm$ 6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>soil</sub> /[Zr] <sub>rock</sub> = 1.11 $\pm$ 0.05; Average soil depth = 61 $\pm$ 12)  SP-1 2.27 35.7938 118.5899 9.3 0.55 $\pm$ 0.05 1.12 $\pm$ 0.06 61 $\pm$ 12 1.05 $\pm$ 0.06 0.84 $\pm$ 0.03 40.2 $\pm$ 5.6 SP-3 2.33 35.7981 118.5833 5.6 0.45 $\pm$ 0.05 1.03 $\pm$ 0.08 N.D. 1.01 $\pm$ 0.08 0.88 $\pm$ 0.02 30.0 $\pm$ 4.6 SP-4 2.27 35.8150 118.5754 1.1 0.29 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 82.8 $\pm$ 11.8 SP-7 2.42 35.7789 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.73 $\pm$ 0.03 50.7 $\pm$ 7.9 SP-8 2.42 35.7830 118.5915 2.2 0.21 $\pm$ 0.05 1.15 $\pm$ 0.06 N.D. 1.07 $\pm$ 0.06 0.97 $\pm$ 0.01 30.0 $\pm$ 4.0											
AP-14 1.89 39.8787 120.1278 0.7 0.26 $\pm$ 0.01 N.D. 37 $\pm$ 7 1.06 $\pm$ 0.03 0.96 $\pm$ 0.00 49.8 $\pm$ 6.6 Sunday Peak (Map = Tobias Peak; Average [Zr] <sub>soi</sub> /[Zr] <sub>rock</sub> = 1.11 $\pm$ 0.05; Average soil depth = 61 $\pm$ 12)  SP-1 2.27 35.7938 118.5899 9.3 0.55 $\pm$ 0.05 1.12 $\pm$ 0.06 61 $\pm$ 12 1.05 $\pm$ 0.06 0.84 $\pm$ 0.03 40.2 $\pm$ 5.6 SP-3 2.33 35.7981 118.5833 5.6 0.45 $\pm$ 0.05 1.03 $\pm$ 0.08 N.D. 1.01 $\pm$ 0.08 0.88 $\pm$ 0.02 30.0 $\pm$ 4.6 SP-4 2.27 35.8150 118.5754 1.1 0.29 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.94 $\pm$ 0.02 82.8 $\pm$ 11.8 SP-7 2.42 35.7789 118.5839 1.1 0.80 $\pm$ 0.05 N.D. N.D. 1.05 $\pm$ 0.05 0.73 $\pm$ 0.03 50.7 $\pm$ 7.9 SP-8 2.42 35.7830 118.5915 2.2 0.21 $\pm$ 0.05 1.15 $\pm$ 0.06 N.D. 1.07 $\pm$ 0.06 0.97 $\pm$ 0.01 30.0 $\pm$ 4.0											
					0.4		1.20±0.03			0.97±0.01	43.0±5.3
SP-1       2.27       35.7938       118.5899       9.3       0.55±0.05       1.12±0.06       61±12       1.05±0.06       0.84±0.03       40.2±5.6         SP-3       2.33       35.7981       118.5833       5.6       0.45±0.05       1.03±0.08       N.D.       1.01±0.08       0.88±0.02       30.0±4.6         SP-4       2.27       35.8150       118.5754       1.1       0.29±0.05       N.D.       N.D.       1.05±0.05       0.94±0.02       82.8±11.8         SP-7       2.42       35.7789       118.5839       1.1       0.80±0.05       N.D.       N.D.       1.05±0.05       0.73±0.03       50.7±7.9         SP-8       2.42       35.7830       118.5915       2.2       0.21±0.05       1.15±0.06       N.D.       1.07±0.06       0.97±0.01       30.0±4.0	AP-14	1.89	39.8787	120.1278	0.7	0.26±0.01	N.D.	37±7	1.06±0.03	0.96±0.00	49.8±6.6
SP-3       2.33       35.7981       118.5833       5.6       0.45±0.05       1.03±0.08       N.D.       1.01±0.08       0.88±0.02       30.0±4.6         SP-4       2.27       35.8150       118.5754       1.1       0.29±0.05       N.D.       N.D.       1.05±0.05       0.94±0.02       82.8±11.8         SP-7       2.42       35.7789       118.5839       1.1       0.80±0.05       N.D.       N.D.       1.05±0.05       0.73±0.03       50.7±7.9         SP-8       2.42       35.7830       118.5915       2.2       0.21±0.05       1.15±0.06       N.D.       1.07±0.06       0.97±0.01       30.0±4.0	Sunday P	eak (Ma	ap = Tobia	s Peak; Ave	rage [Z	$r]_{soil}/[Zr]_{rock} =$	1.11±0.05;	Average	soil depth =	61±12)	
SP-3       2.33       35.7981       118.5833       5.6       0.45±0.05       1.03±0.08       N.D.       1.01±0.08       0.88±0.02       30.0±4.6         SP-4       2.27       35.8150       118.5754       1.1       0.29±0.05       N.D.       N.D.       1.05±0.05       0.94±0.02       82.8±11.8         SP-7       2.42       35.7789       118.5839       1.1       0.80±0.05       N.D.       N.D.       1.05±0.05       0.73±0.03       50.7±7.9         SP-8       2.42       35.7830       118.5915       2.2       0.21±0.05       1.15±0.06       N.D.       1.07±0.06       0.97±0.01       30.0±4.0	SP-1	2.27	35.7938	118.5899	9.3	0.55±0.05	1.12±0.06	61±12	1.05±0.06	0.84±0.03	40.2±5.6
SP-4       2.27       35.8150       118.5754       1.1       0.29±0.05       N.D.       N.D.       1.05±0.05       0.94±0.02       82.8±11.8         SP-7       2.42       35.7789       118.5839       1.1       0.80±0.05       N.D.       N.D.       1.05±0.05       0.73±0.03       50.7±7.9         SP-8       2.42       35.7830       118.5915       2.2       0.21±0.05       1.15±0.06       N.D.       1.07±0.06       0.97±0.01       30.0±4.0				118.5833							
SP-7 2.42 35.7789 118.5839 1.1 0.80±0.05 N.D. N.D. 1.05±0.05 0.73±0.03 50.7±7.9 SP-8 2.42 35.7830 118.5915 2.2 0.21±0.05 1.15±0.06 N.D. 1.07±0.06 0.97±0.01 30.0±4.0											
SP-8 2.42 35.7830 118.5915 2.2 0.21±0.05 1.15±0.06 N.D. 1.07±0.06 0.97±0.01 30.0±4.0											
	SP-9	2.25			3.0	0.31±0.05	N.D.	N.D.	1.05±0.05	0.94±0.02	
SP-19 2.28 35.7878 118.5801 9.3 0.41±0.05 N.D. N.D. 1.05±0.05 0.90±0.02 9.2±1.2								N.D.	1.05±0.05		

SUPPLEMENTAL TABLE 3. (continued)

Sample		Location		Area	Average	[Zr] <sub>soil</sub> †	Soil	Dissolution	Shielding	Erosion
	Altitude	e Lat	Long		gradient*	[Zr] <sub>rock</sub>	depth§	factor#	factor**	rate††
	(km)	(° N)	(° W)	(ha)	(m/m)		(cm)			(mm/k.y.)
Nichols Po	eak (Ma	p = Cane	Canyon; Ave	erage [Z	[r] <sub>soil</sub> /[Zr] <sub>rock</sub> =	1.25±0.08;	Average	e soil depth =	: 30±1 cm)	
NP-1	1.12	35.5922	118.2255	1.1	0.44±0.02	N.D.	33±6	1.07±0.08	0.88±0.01	41.6±4.8
NP-4	1.33	35.5853	118.2181	1.5	0.65±0.05	N.D.	N.D.	1.06±0.08	0.79±0.03	21.0±2.6
NP-6	1.28	35.5870	118.2181	2.6	0.65±0.05	N.D.	N.D.	1.06±0.08	0.79±0.03	28.9±3.3
NP-7	1.26	35.6003	118.2120	2.2	0.46±0.05	N.D.	N.D.	1.06±0.08	0.88±0.02	43.5±7.1
NP-10	1.43	35.5820	118.1808	3.3	0.68±0.05	N.D.	N.D.	1.06±0.08	0.78±0.03	53.8±14.4
NP-14	1.37	35.5783	118.1977	0.7	0.23±0.02	N.D.	28±3	1.06±0.08	0.96±0.01	64.9±9.5
NP-15	1.36	35.5781	118.1981	1.1	0.29±0.05	N.D.	N.D.	1.06±0.08	0.94±0.02	52.5±6.2
NP-17	1.15	35.5232	118.2090	5.9	0.16±0.05	N.D.	N.D.	1.06±0.08	0.98±0.01	38.1±5.7
NP-18	1.18	35.5221	118.2014	0.7	0.24±0.02	1.25±0.08	29±2	1.06±0.08	0.96±0.01	29.1±4.2

\*Average hillslope gradient measured by field surveys and from U.S. Geological Survey 7.5′ quadrangles. Map names are listed in parenthesis next to site names. Refer to Figure 1 for catchment locations.

†[Zr] measured by XRF. Samples of regolith and bedrock were taken from widely distributed locations within a subset of the study catchments. For catchments where no Zr concentrations are available, we used site-wide averages (weighted by inverse variance and listed next to site names) from regolith and outcrop samples.

§Soil (we use "soil" and "regolith" interchangeably here) depth measured from widely distributed pits on hillslopes within study catchments. For catchments where no soil depths are available, we used site-wide average values (listed next to site names).

#Dissolution correction factors are estimated from Zr enrichment in the soil and soil depths, and apply to production rates (see equation 3, published manuscript). Within each site, the dissolution correction is relatively uniform across the catchments and is small (<1.14). Thus any errors introduced by using average soil depths and [Zr] should be small, and would not substantially affect the analysis presented in this study.

\*\*Shielding correction factors apply to production rates, and account for horizon shielding by hillslopes and depth shielding imposed by soil and rock during exhumation (Dunne et al., 1999).

††Reported erosion rates are inverse-variance-weighted averages±standard errors (Bevington, 1969) of erosion rates calculated from equation 3 for each nuclide. Reported erosion rate uncertainties were propagated using random and analytical uncertainties, and ignoring systematic uncertainties in production rates. Uncertainties on absolute erosion rates are therefore somewhat higher. Soil density is assumed to be 1.6±0.4 g/cm<sup>3</sup>. Rock density is 2.7 g/cm<sup>3</sup>. Solving equation 3 for erosion rate requires estimates of  $P_n$  and  $P_m$ . Cosmogenic nuclide production rates in quartz at the earth's surface depend on altitude and latitude (Lal. 1958; Lal and Peters, 1967; Lal. 1991). Spallogenic production rates can be scaled from sea-level, high latitude (SLHL) reference values to sample altitude and geographic latitude using Table 2 of Lal (1991). The cosmic ray muon flux to Earth's surface is not strongly sensitive to latitude (Allkofer and Jokisch, 1973). We therefore neglect latitude scaling of muogenic production rates in this analysis. Altitude scaling of muogenic production is best approximated by assuming exponential attenuation in the atmosphere, with a mean free path of 247 g/cm<sup>2</sup> (Rossi, 1948). Nuclide accumulation on sloped surfaces is affected by topographic shielding, which effectively reduces production both at depth and at the surface. These effects can be accounted for using shielding correction factors that depend on hillslope angle (Dunne et al., 1999). SLHL muogenic production rates are estimated here to be (in atoms/g/yr)  $P_m = 0.11\pm0.01$  for <sup>10</sup>Be and  $P_m =$ 0.81±0.11 for <sup>26</sup>Al, based on sea level stopping rates reported by Barton and Slade (1965), chemical compound factors and nuclear capture probabilities summarized by Heisinger et al. (1997), and branching ratio estimates for production of <sup>26</sup>Al (Strack et al., 1994) and <sup>10</sup>Be (Heisinger et al., 1997). For a detailed summary of muogenic production systematics, see Stone et al. (1998a). Based on these SLHL muogenic production rates (which agree with estimates reported elsewhere; see Brown et al., 1995a and Stone et al., 1998b), the overall contribution of muons to <sup>26</sup>Al and <sup>10</sup>Be production at the surface is only ~3%, much lower than earlier estimates of ~20% (Lal, 1991). In light of this revelation, we needed to revise estimates of SLHL spallogenic production rates that have been calibrated in previous work. SLHL spallogenic production rates used here are (in atoms/g/yr)  $P_n = 4.72 \pm 0.38$  for <sup>10</sup>Be and  $P_n = 28.45 \pm 2.71$  for <sup>26</sup>Al. The SLHL  $P_n$  for <sup>10</sup>Be used in this study is an average of rescaled estimates from four calibration studies: 1) the Nishiizumi et al. (1989) work on glacial retreat in the Sierra Nevada, 2) the Clark et al. (1995) work on Laurentide ice retreat in New Jersey, USA, 3) the Stone et al. (1998b) work on glacial retreat in Scotland, and 4) the Kubik et al. (1998) work on the Köfels landslide in Austria. SLHL Pn for <sup>26</sup>Al is calculated as the product of SLHL  $P_n$  for <sup>10</sup>Be and the spallogenic production rate ratio of <sup>26</sup>Al/<sup>10</sup>Be, which we take to be 6.03±0.31 from data reported in the Sierra Nevada calibration study. Note that to rescale the Sierra Nevada production rates, we used <sup>10</sup>Be and <sup>26</sup>Al concentrations reported by Nishiizumi et al. (1989), revised glacial retreat ages reported by Clark et al. (1995), and, as suggested by Nishiizumi et al. (1996), geographic latitude of the calibration samples.

§§N.D. = not determined.

##For the Grizzly Dome catchments, we have no soil depth or [Zr] data. We assume that [Zr] enrichment factor at Grizzly Dome is 1.36±0.05, equal to the site-wide average at Fall River, which, having a similar climate, should also have a similar chemical weathering intensities (and thus [Zr] enrichments). We further assume that soil depth at Grizzly Dome is 40±5 cm, which is close to the median value for our study sites and should therefore be a reasonable estimate. Erosion rates estimates for Grizzly Dome are insensitive to plausible errors introduced by these assumptions, because soil depth and [Zr] are only necessary in accounting for the effect of weathering dissolution on cosmogenic erosion rates. Neglecting the dissolution effect entirely would result in less than 14% error in erosion rates at our other six sites, implying that any erosion rate errors introduced by assuming incorrect soil depths and [Zr] for Grizzly Dome should be small, and would not affect our analysis

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