

Cosmonuclide modelling: data inputs, outputs and graphs

Table S1. 4m Erosion field data inputs

Latitude	Longitude	Altitude	Shielding	Min density	Max density	Mean basin altitude	Minimum age	Maximum age	Maximum lowering
°N	°E	m	1 or less	g/cm ³	g/cm ³	M	Ma	Ma	m
37.12692	-2.148214	495	1	1.9	2.2	689	0	10	4

Table S2 4m Erosion model profile inputs

Profile depth	N	dN	z	dz	Nuclide
m	at/g	at/g	cm	cm	10,26,21
0	1094000	31540	5	5	10
0.5	886500	29300	50	10	10
1.0	678700	21310	100	10	10
1.5	574300	18560	150	10	10
2.0	420500	13880	200	10	10
0	5982000	206100	5	5	26
0.5	4636000	157900	50	10	26
1.0	3455000	123000	100	10	26
1.5	2716000	96700	150	10	26
2.0	2215000	76010	200	10	26

Table S3. 4m Erosion cosmonuclide data

Profile depth	Latitude	Longitude	Elevation	Elv/pressure	Depth	+/-
m	(DD)	(DD)	(m)	flag	(cm)	
0	37.12692	-2.148214	495	std	5	5
0.5	37.12692	-2.148214	495	std	50	10
1.0	37.12692	-2.148214	495	std	100	10
1.5	37.12692	-2.148214	495	std	150	10
2.0	37.12692	-2.148214	495	std	200	10

Table S4. 4m Erosion cosmonuclide data ctd

Sample name	[Be-10]	+/-	Be AMS	at ²⁶ Al/g	sigma ²⁶ Al at/g	Al AMS	²⁶ Al/ ¹⁰ Be	sigma ²⁶ Al/ ¹⁰ Be
m	atoms g-1	atoms g-1	standard	0	0	standard		
0	1.09E+06	3.15E+04	Nist_27900	5.98E+06	2.06E+05	Z92-0222	5.47	0.25
0.5	8.87E+05	2.93E+04	0	4.64E+06	1.58E+05	#####	5.23	0.25
1.0	6.79E+05	2.13E+04	0	3.46E+06	1.23E+05	#####	5.09	0.24
1.5	5.74E+05	1.86E+04	0	2.72E+06	9.67E+04	#####	4.73	0.23
2.0	4.21E+05	1.39E+04	0	2.22E+06	7.60E+04	#####	5.27	0.25

4m Erosion model outputs

Table S5. Raw outputs (4m)

6 degrees of freedom.				
180/60000 minimization models in one sigma				
314/60000 models in one sigma including random models and filter				
X ² _{min}=	17.2066	X ² _{max}=	6	P(X ² _{max})=0.0011128
20.0493; DOF=				
Age (a) best=458ka [	169	-	798	ka]
Density (g cm ⁻³) best=1.9013 [	1.9	-	2.0048]
Erosion rate (mm ka ⁻¹) best=5.1 [	0.05	-	5.72]
Inheritance (¹⁰ Be atoms g ⁻¹) best=360580 [	327174	-	388985]
Inheritance (²⁶ Al atoms g ⁻¹) best=1545103 [	1386165	-	1778939]
Burial age (Ma) best=0.879 [	0.679	-	1.048]
Basin erosion rate (m/Ma) best=7.4 [	6.6	-	8.7]

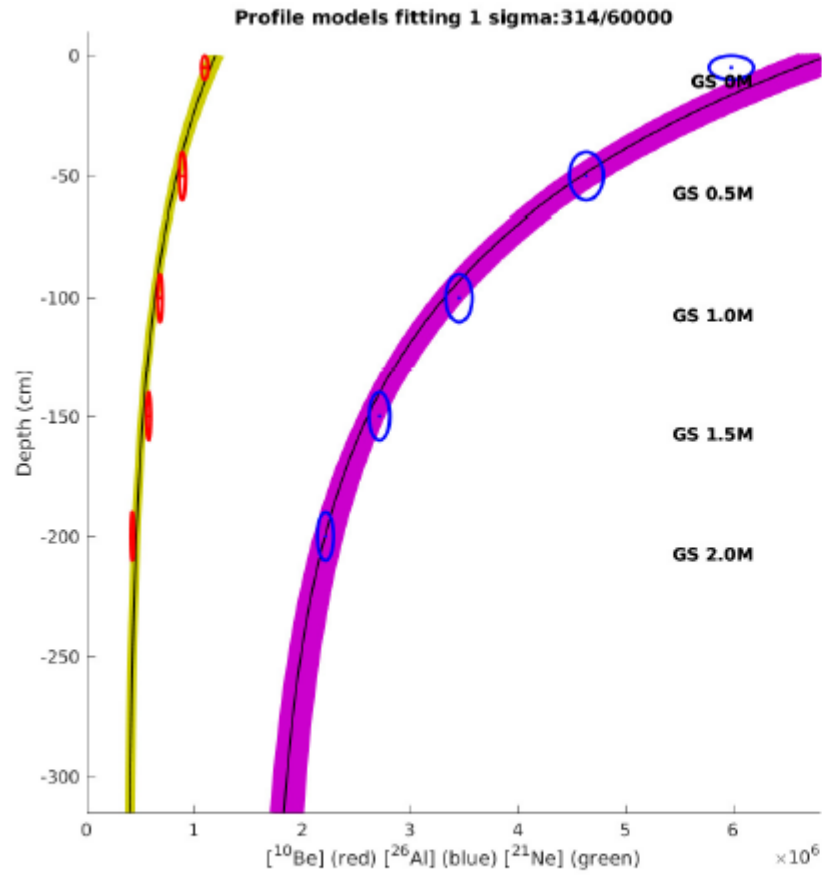
Table S6. Output by profile (4m)

Minimum exposure age	Maximum exposure age	Minimum burial age	Maximum burial age	min erosion rate	max erosion rate	min basin erosion	max basin erosion	min 10Be inher	max 10Be inher	Rduced chi-sq
169	798	0.679	1.048	0.05	5.72	6.6	8.7	327174	388985	2.867767

Table S7. 4m Erosion plotting data

bur	error	basin erosion	error
0.8635	0.1845	7.65	1.05

Figure S1. 4m Erosion profile model



^{10}Be ($t_{1/2}=1387\text{ka}$) $P_{sp}=5.5181 \cdot e^{-z/160}$ $P_{fm}=0.041349 \cdot e^{-z/1796.7076}$ $P_{sm}=0.047179 \cdot e^{-z/1106.8071}$
 ^{26}Al ($t_{1/2}=705\text{ka}$) $P_{sp}=37.2284 \cdot e^{-z/160}$ $P_{fm}=0.28496 \cdot e^{-z/1796.7076}$ $P_{sm}=0.53495 \cdot e^{-z/1106.8071}$
 Good fit: $P(X_{\min} > X > X_{\max}) = 68.27\%$ $P(X > X_{\min})$
 314 models fitting 1 sigma.

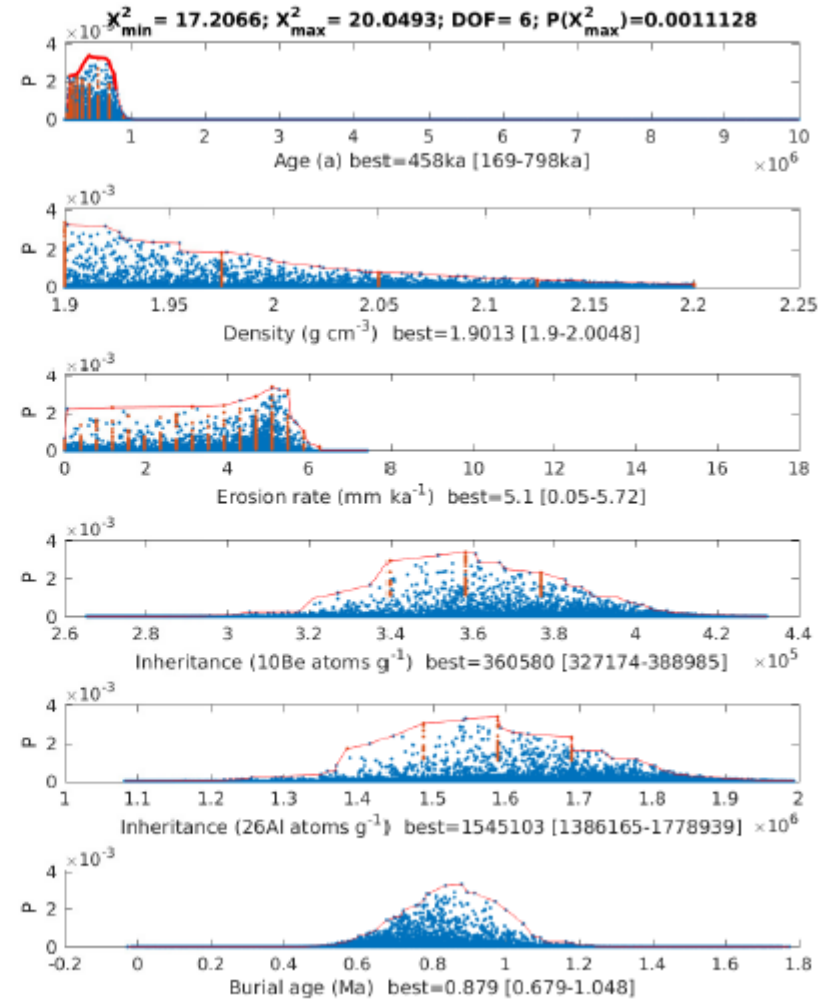


Figure S2. 4m Erosion production rates

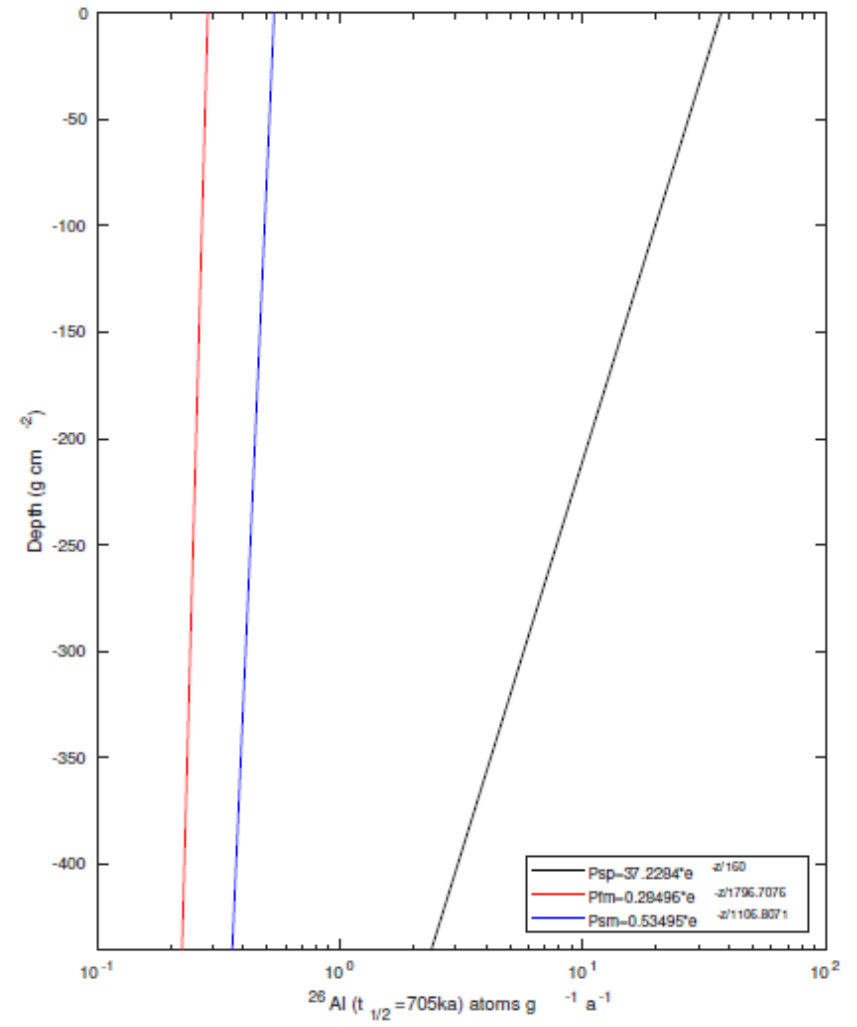
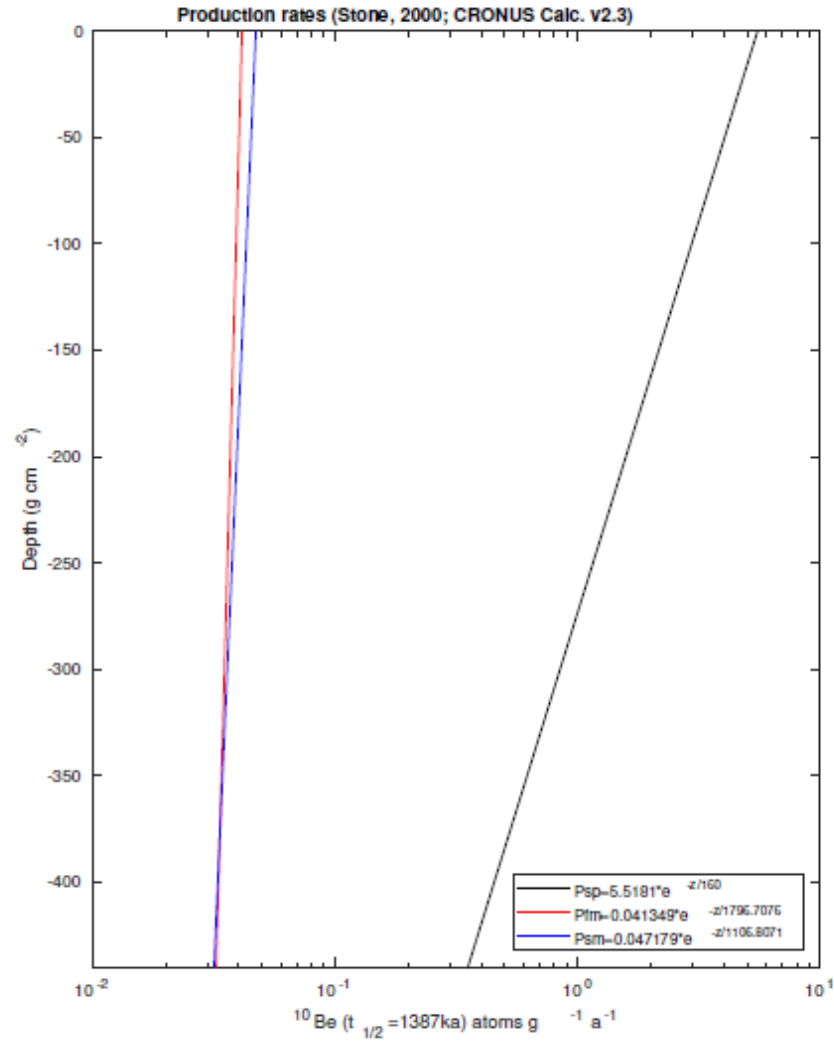


Figure S3. 4m Erosion time-erosion modelling

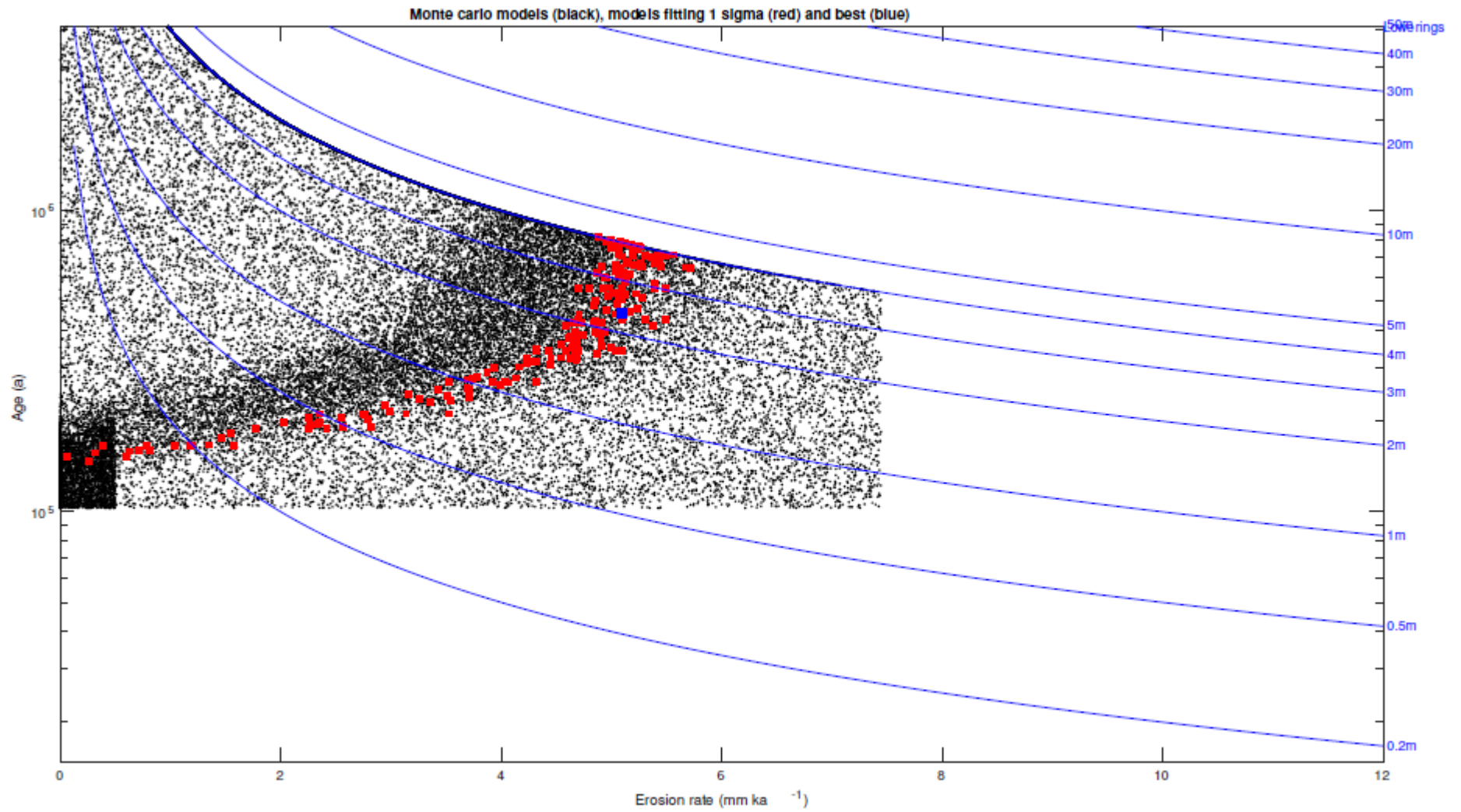


Figure S4. 4m Erosion inheritance banana plot

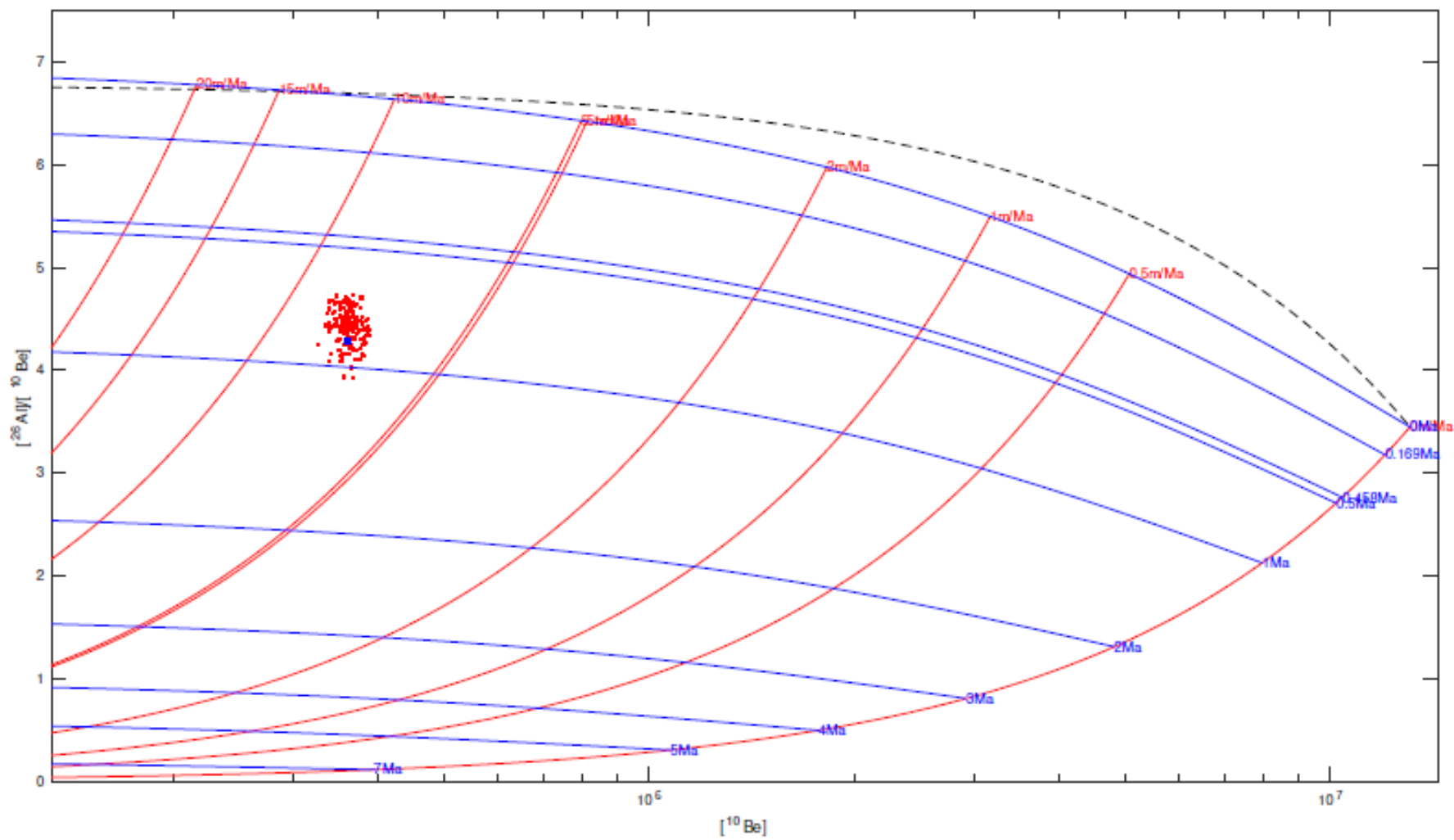


Table S8. 10m Erosion field data inputs

Latitude	Longitude	Altitude	Shielding	Min density	Max density	Mean basin altitude	Minimum age	Maximum age	Maximum lowering
°N	°E	m	1 or less	g/cm ³	g/cm ³	M	Ma	Ma	m
37.12692	-2.148214	495	1	1.9	2.2	689	0	10	10

Table S9. 10m Erosion model profile inputs

Profile depth	N	dN	z	dz	Nuclide
m	at/g	at/g	cm	cm	10,26,21
0	1094000	31540	5	5	10
0.5	886500	29300	50	10	10
1.0	678700	21310	100	10	10
1.5	574300	18560	150	10	10
2.0	420500	13880	200	10	10
0	5982000	206100	5	5	26
0.5	4636000	157900	50	10	26
1.0	3455000	123000	100	10	26
1.5	2716000	96700	150	10	26
2.0	2215000	76010	200	10	26

Table S10. 10m Erosion cosmonuclide data

Profile depth	Latitude	Longitude	Elevation	Elv/pressure	Depth	+/-
m	(DD)	(DD)	(m)	flag	(cm)	
0	37.12692	-2.148214	495	std	5	5
0.5	37.12692	-2.148214	495	std	50	10
1.0	37.12692	-2.148214	495	std	100	10
1.5	37.12692	-2.148214	495	std	150	10
2.0	37.12692	-2.148214	495	std	200	10

Table S11. 10m Erosion cosmonuclide data ctd

Sample name	[Be-10] atoms g ⁻¹	+/- atoms g ⁻¹	Be AMS standard	at ²⁶ Al/g 0	sigma ²⁶ Al at/g 0	Al AMS standard	²⁶ Al/ ¹⁰ Be	sigma ²⁶ Al/ ¹⁰ Be
0	1.09E+06	3.15E+04	Nist_27900	5.98E+06	2.06E+05	Z92-0222	5.47	0.25
0.5	8.87E+05	2.93E+04	0	4.64E+06	1.58E+05	#####	5.23	0.25
1.0	6.79E+05	2.13E+04	0	3.46E+06	1.23E+05	#####	5.09	0.24
1.5	5.74E+05	1.86E+04	0	2.72E+06	9.67E+04	#####	4.73	0.23
2.0	4.21E+05	1.39E+04	0	2.22E+06	7.60E+04	#####	5.27	0.25

10m Erosion model outputs**Table S12.** Raw outputs (10m)

6 degrees of freedom.				
214/60000 minimization models in one sigma				
392/60000 models in one sigma including random models and filter				
X ² _[min] =	16.6741	X ² _[max] = 19.5343; DOF=	6	P(X ² _{[max])=0.0013666}
Age (a) best=1210ka [	169	-	1990	ka]
Density (g cm ⁻³) best=1.9011 [	1.9	-	2.0255]
Erosion rate (mm ka ⁻¹) best=5.3 [	0.04	-	5.98]
Inheritance (10Be atoms g ⁻¹) best=335489 [	310800	-	384930]
Inheritance (26Al atoms g ⁻¹) best=1433064 [	1284860	-	1750584]
Burial age (Ma) best=0.892 [	0.679	-	1.056]
Basin erosion rate (m/Ma) best=8 [	6.8	-	9.3]

Table S13. Output by profile (10m)

Minimum exposure age	Maximum exposure age	Minimum burial age	Maximum burial age	min erosion rate	max erosion rate	min basin erosion	max basin erosion	min 10Be inher	max 10Be inher	Rduced chi-sq
169	1990	0.679	1.056	0.04	5.98	6.8	9.3	310800	384930	2.779016667

Table S14. 10m Erosion plotting data

bur	error	basin erosion	error
0.8675	0.1885	8.05	1.25

Figure S5. 10m Erosion profile model

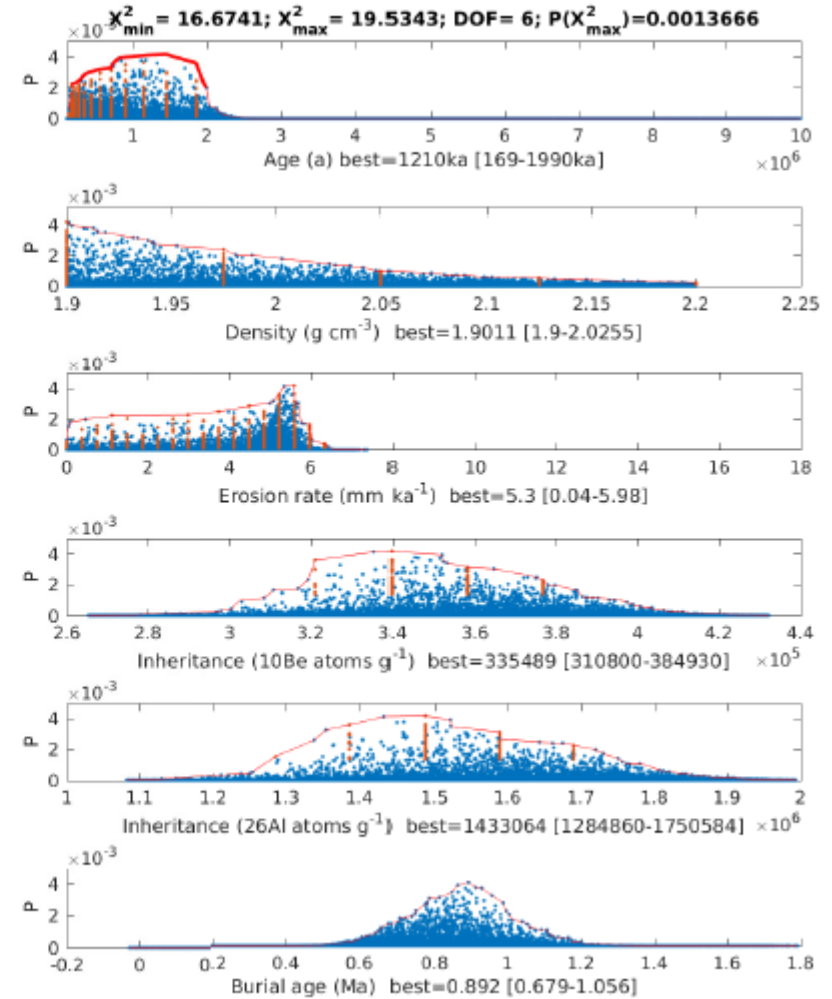
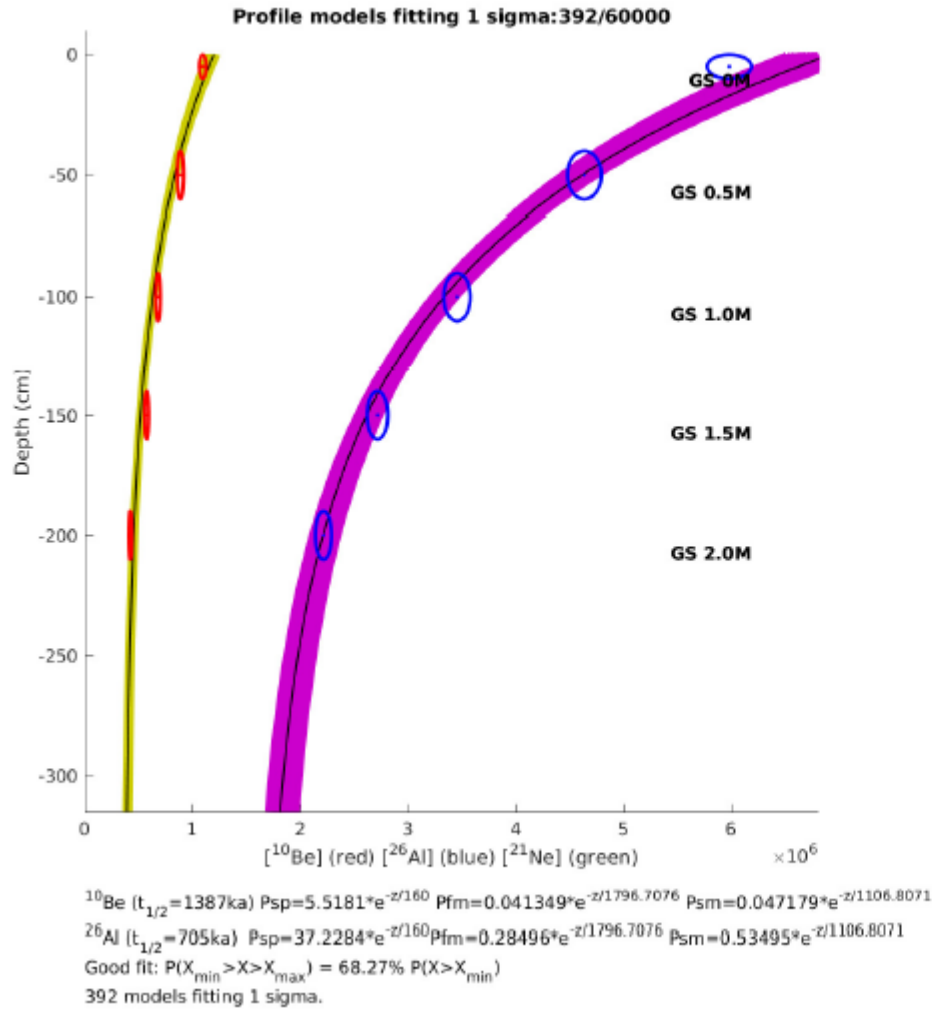


Figure S6. 10m Erosion production rates

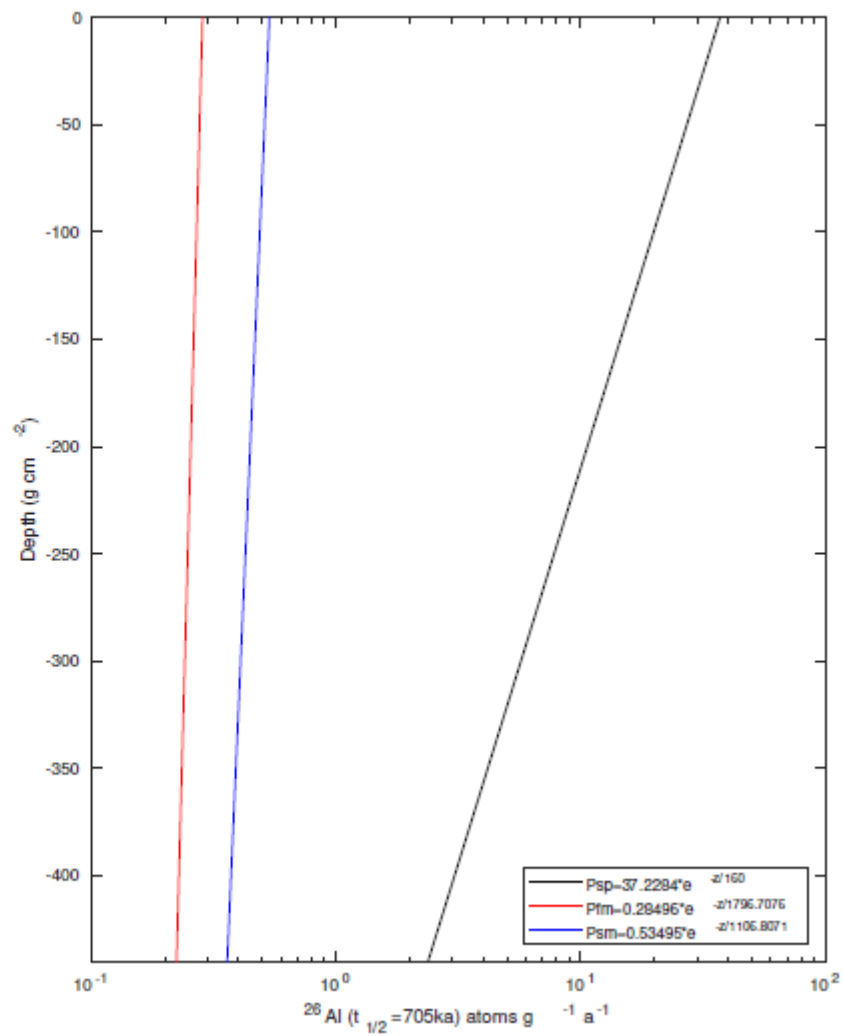
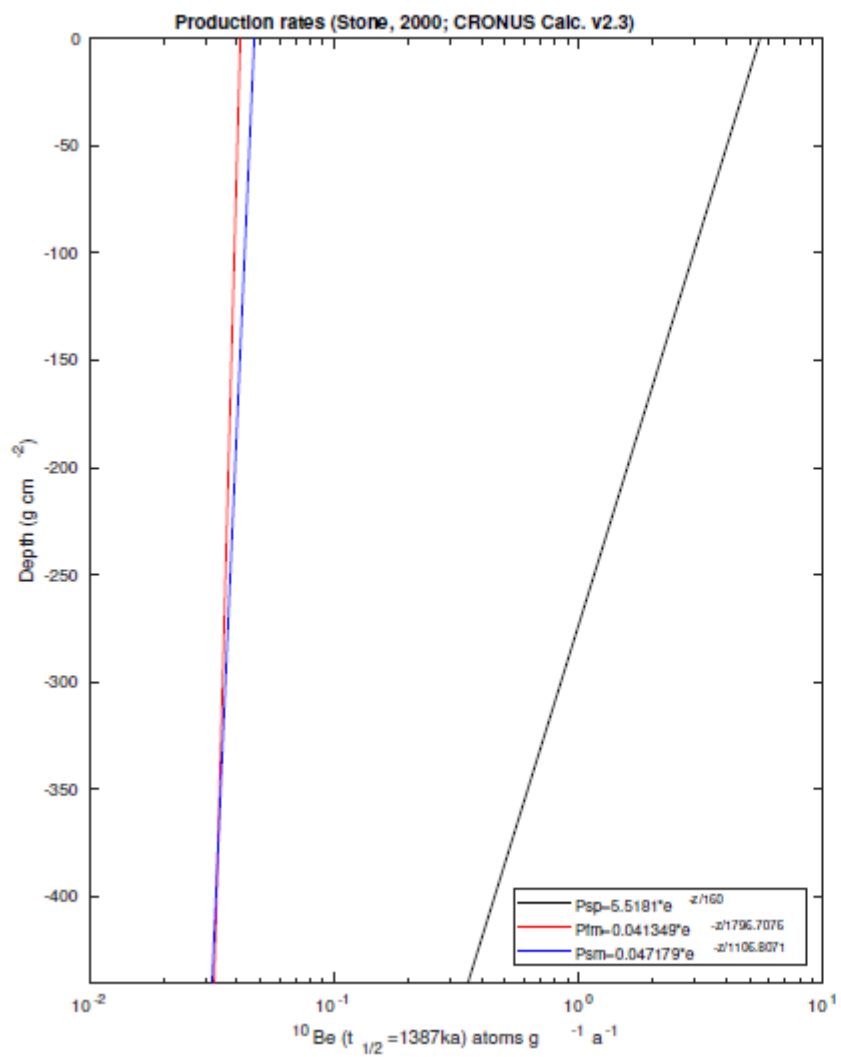


Figure S7. 10m Erosion time-erosion modelling

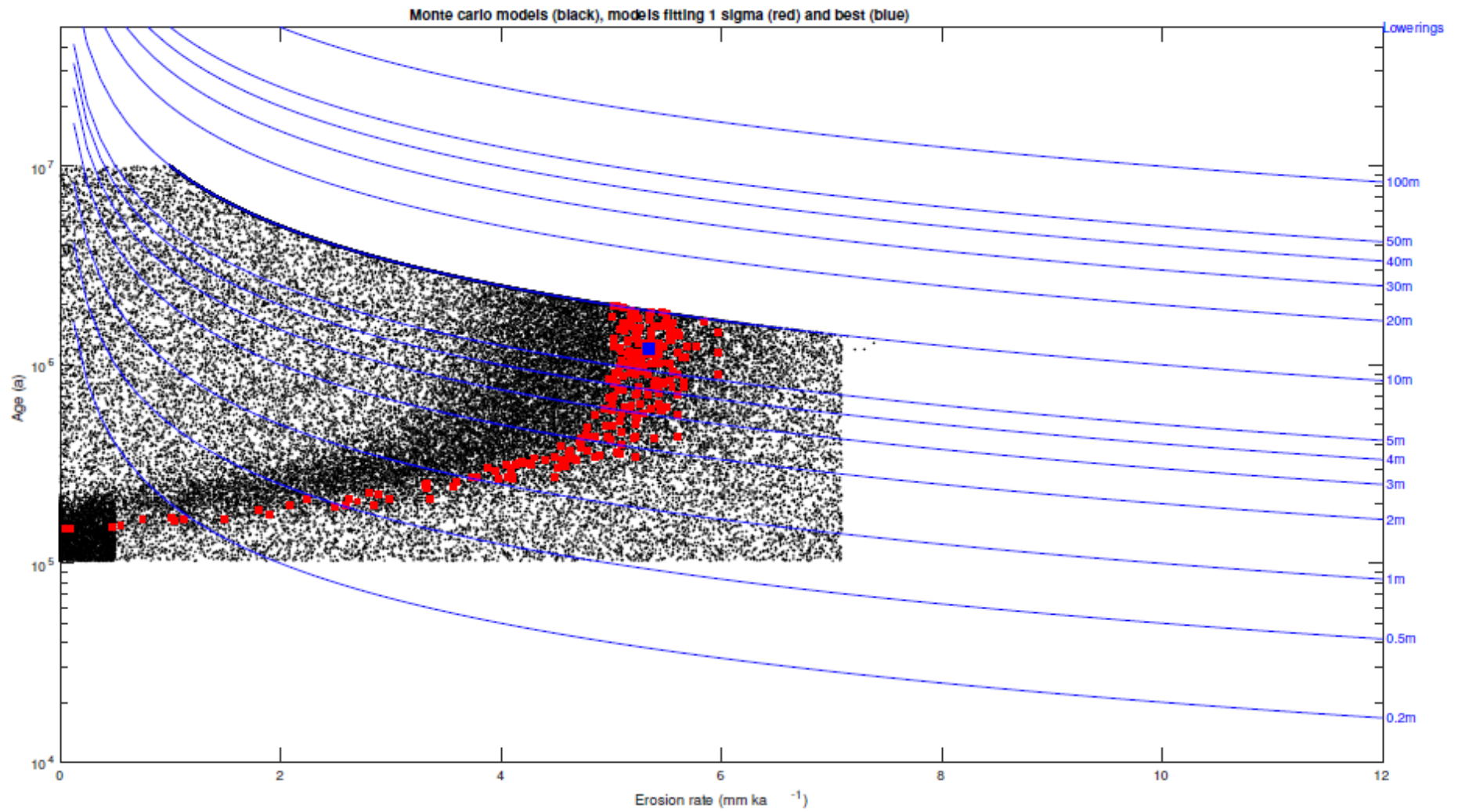


Figure S8. 10m Erosion inheritance banana plot

