

Supplementary

Supplementary Section 1: Dataset

Raw Sediment Weight Data								
Sediment Size	sieve #	18	40	60	100	140	230	fines
	Phi	0	1.234	2	2.737	3.238	4	>4
Sediment Weight (g)	mm	1	0.425	0.25	0.15	0.106	0.063	<0.063
	Control 1	1.287	12.290	22.177	7.707	0.907	0.133	0.400
	Control 2	0.163	1.377	2.650	1.607	0.263	0.270	0.160
	Control 3	1.700	32.670	31.757	16.797	1.973	0.407	33.680
	Open 1	0.000	0.247	0.690	1.177	0.287	0.123	0.510
	Open 2	0.060	0.317	1.133	1.363	0.250	0.130	0.030
	Open3	0.100	0.077	0.390	0.697	0.177	0.037	0.317
	Halfway 1	0.040	0.130	0.560	0.620	0.057	0.040	0.017
	Halfway 2	0.023	0.087	0.313	0.433	0.123	0.083	0.197
	Halfway 3	0.090	0.440	0.870	0.883	0.190	0.087	0.287
	Closed 1	0.217	0.827	0.803	0.753	0.203	0.727	0.330
	Closed 2	0.053	0.493	0.917	0.507	0.050	0.127	0.400
	Closed 3	0.233	1.310	2.110	1.207	0.217	0.140	0.453

Supplementary Section 2: Bootstrap Tables

Sup. Table S1: Bootstrap resampling of the control sample with grain size of phi = 0 (1 mm)

	C1 (weight)	C2 (weight)	C3 (weight)
Measured	1.287	0.163	1.7
Resample 1	1.287	0.163	0.163
Resample 2	1.7	1.7	1.7
Resample 3	1.287	0.163	1.287
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.	.	.	.
Resample 5000	0.163	1.287	1.7

Sup. Table S2: Bootstrap sample weights

	Sum 1 $\varphi = 0$ (1mm)	Sum 2 $\varphi = 1.23$ (0.425mm)	Sum 3 $\varphi = 2$ (0.25mm)	Sum 4 $\varphi = 2.74$ (0.15mm)	Sum 5 $\varphi = 3.24$ (0.106mm)	Sum 6 $\varphi = 4$ (0.063mm)	Sum 7 $\varphi > 4$ (<0.063 mm)	Total Sample Weight
Measured	3.15	46.336	56.58	26.108	3.142	0.8099	34.24	170.37
Resample 1	1.613	25.956	109.8
Resample 2	5.1	57.25	243.92
Resample 3	2.737	35.42	153.04
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Resample 5000	3.15	15.042	146.2

Sup. Table S3: Bootstrapped proportions

	Prop 1 $\varphi = 0$ (1mm)	Prop 2 $\varphi = 1.23$ (0.425mm)	Prop 3 $\varphi = 2$ (0.25mm)	Prop 4 $\varphi = 2.74$ (0.15mm)	Prop 5 $\varphi = 3.24$ (0.106mm)	Prop 6 $\varphi = 4$ (0.063mm)	Prop 7 $\varphi > 4$ (<0.063 mm)
Measured	0.0185	0.272	0.332	0.153	0.0184	0.005	0.2
Resample 1	0.0093	0.15
Resample 2	0.0274	0.31
Resample 3	0.023	0.299
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Resample 5000	0.026	0.34

Supplementary Section 3: Tukey's 'Honest Significant Difference'

A set of confidence intervals on the differences between the means of different grain size with the specified family-wise probability of coverage. The intervals are based on the Studentized range statistic, Tukey's 'Honest Significant Difference' method.

Sup. Table S4: Tukey's Confidence Interval for Control Setting

	diff	lwr	upr	p adj
s1-s5	0.002412	0.000263	0.004561	0.016317
s6-s5	0.042832	0.040683	0.044981	0
s7-s5	0.059939	0.05779	0.062088	0
s4-s5	0.165343	0.163194	0.167492	0
s2-s5	0.178904	0.176755	0.181053	0
s3-s5	0.274949	0.2728	0.277098	0
s6-s1	0.04042	0.038271	0.042569	0
s7-s1	0.057528	0.055378	0.059677	0
s4-s1	0.162931	0.160782	0.16508	0
s2-s1	0.176492	0.174343	0.178641	0
s3-s1	0.272537	0.270388	0.274686	0
s7-s6	0.017107	0.014958	0.019256	0
s4-s6	0.122511	0.120362	0.12466	0
s2-s6	0.136072	0.133923	0.138221	0
s3-s6	0.232117	0.229968	0.234266	0
s4-s7	0.105404	0.103255	0.107553	0
s2-s7	0.118964	0.116815	0.121114	0
s3-s7	0.215009	0.21286	0.217158	0
s2-s4	0.013561	0.011412	0.01571	0
s3-s4	0.109606	0.107457	0.111755	0
s3-s2	0.096045	0.093896	0.098194	0

Sup. Table S5: Tukey's Confidence Interval for Closed Setting

	diff	lwr	upr	p adj
s1-s5	0.002412	0.000263	0.004561	0.016317
s6-s5	0.042832	0.040683	0.044981	0
s7-s5	0.059939	0.05779	0.062088	0
s4-s5	0.165343	0.163194	0.167492	0
s2-s5	0.178904	0.176755	0.181053	0
s3-s5	0.274949	0.2728	0.277098	0
s6-s1	0.04042	0.038271	0.042569	0
s7-s1	0.057528	0.055378	0.059677	0
s4-s1	0.162931	0.160782	0.16508	0
s2-s1	0.176492	0.174343	0.178641	0
s3-s1	0.272537	0.270388	0.274686	0
s7-s6	0.017107	0.014958	0.019256	0
s4-s6	0.122511	0.120362	0.12466	0
s2-s6	0.136072	0.133923	0.138221	0
s3-s6	0.232117	0.229968	0.234266	0
s4-s7	0.105404	0.103255	0.107553	0
s2-s7	0.118964	0.116815	0.121114	0
s3-s7	0.215009	0.21286	0.217158	0
s2-s4	0.013561	0.011412	0.01571	0
s3-s4	0.109606	0.107457	0.111755	0
s3-s2	0.096045	0.093896	0.098194	0

Sup. Table S6: Tukey's Confidence Interval for Halfway Setting

	diff	lwr	upr	p adj
s6-s1	0.010148	0.007996	0.0123	0
s5-s1	0.039128	0.036976	0.041281	0
s7-s1	0.061358	0.059206	0.06351	0
s2-s1	0.088633	0.086481	0.090785	0
s3-s1	0.285305	0.283152	0.287457	0
s4-s1	0.321205	0.319053	0.323357	0
s5-s6	0.028981	0.026828	0.031133	0
s7-s6	0.05121	0.049058	0.053362	0
s2-s6	0.078485	0.076333	0.080637	0
s3-s6	0.275157	0.273005	0.277309	0
s4-s6	0.311057	0.308905	0.313209	0
s7-s5	0.02223	0.020078	0.024382	0
s2-s5	0.049505	0.047352	0.051657	0
s3-s5	0.246176	0.244024	0.248328	0
s4-s5	0.282077	0.279924	0.284229	0
s2-s7	0.027275	0.025123	0.029427	0
s3-s7	0.223946	0.221794	0.226099	0
s4-s7	0.259847	0.257695	0.261999	0
s3-s2	0.196672	0.194519	0.198824	0
s4-s2	0.232572	0.23042	0.234724	0
s4-s3	0.0359	0.033748	0.038052	0

Sup. Table S7: Tukey's Confidence Interval for Open Setting

	diff	lwr	upr	p adj
s6-s1	0.016165	0.014189	0.01814	0
s2-s1	0.058768	0.056792	0.060743	0
s5-s1	0.068857	0.066882	0.070833	0
s7-s1	0.083974	0.081999	0.08595	0
s3-s1	0.253776	0.251801	0.255752	0
s4-s1	0.378436	0.37646	0.380411	0
s2-s6	0.042603	0.040627	0.044578	0
s5-s6	0.052692	0.050717	0.054668	0
s7-s6	0.06781	0.065834	0.069785	0
s3-s6	0.237611	0.235636	0.239587	0
s4-s6	0.362271	0.360295	0.364247	0
s5-s2	0.010089	0.008114	0.012065	0
s7-s2	0.025207	0.023231	0.027182	0
s3-s2	0.195009	0.193033	0.196984	0
s4-s2	0.319668	0.317693	0.321644	0
s7-s5	0.015117	0.013142	0.017093	0
s3-s5	0.184919	0.182944	0.186895	0
s4-s5	0.309579	0.307603	0.311554	0
s3-s7	0.169802	0.167826	0.171777	0
s4-s7	0.294461	0.292486	0.296437	0
s4-s3	0.12466	0.122684	0.126635	0