

GSA Data Repository 2019278

de Haas, T., and Densmore, A.L., 2019, Debris-flow volume quantile prediction from catchment morphometry: Geology, <https://doi.org/10.1130/G45950.1>

Fig. DR1: Method for determining debris-flow lobe cross-sectional area, which is subsequently converted to lobe volume using eq. 2 (Griswold and Iverson, 2008).

Fig. DR2: Mapped lobes on fan S06.

Fig. DR3: Measured versus estimated flow volume (with $\epsilon = 0.1$) for 15 recent debris-flow deposits in Saline Valley. The solid line indicates a 1:1 relationship, while the dashed lines indicate the factor two uncertainty range. The error bounds on the estimated flow volume stem from the uncertainty in cross-sectional area estimation.

Fig. DR4: Correlation between catchment characteristics.

Fig. DR1

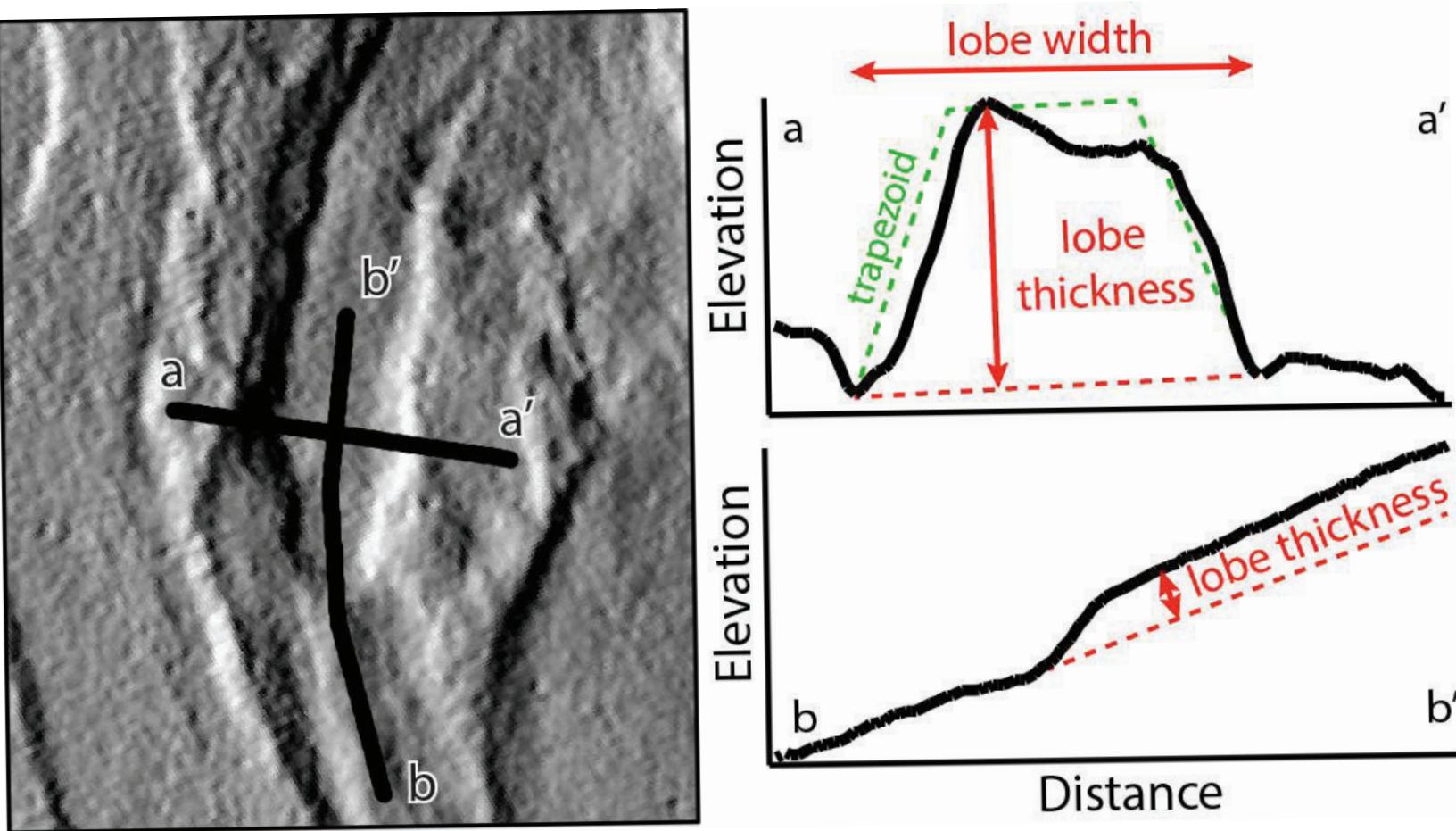


Fig. DR2



Fig. DR3

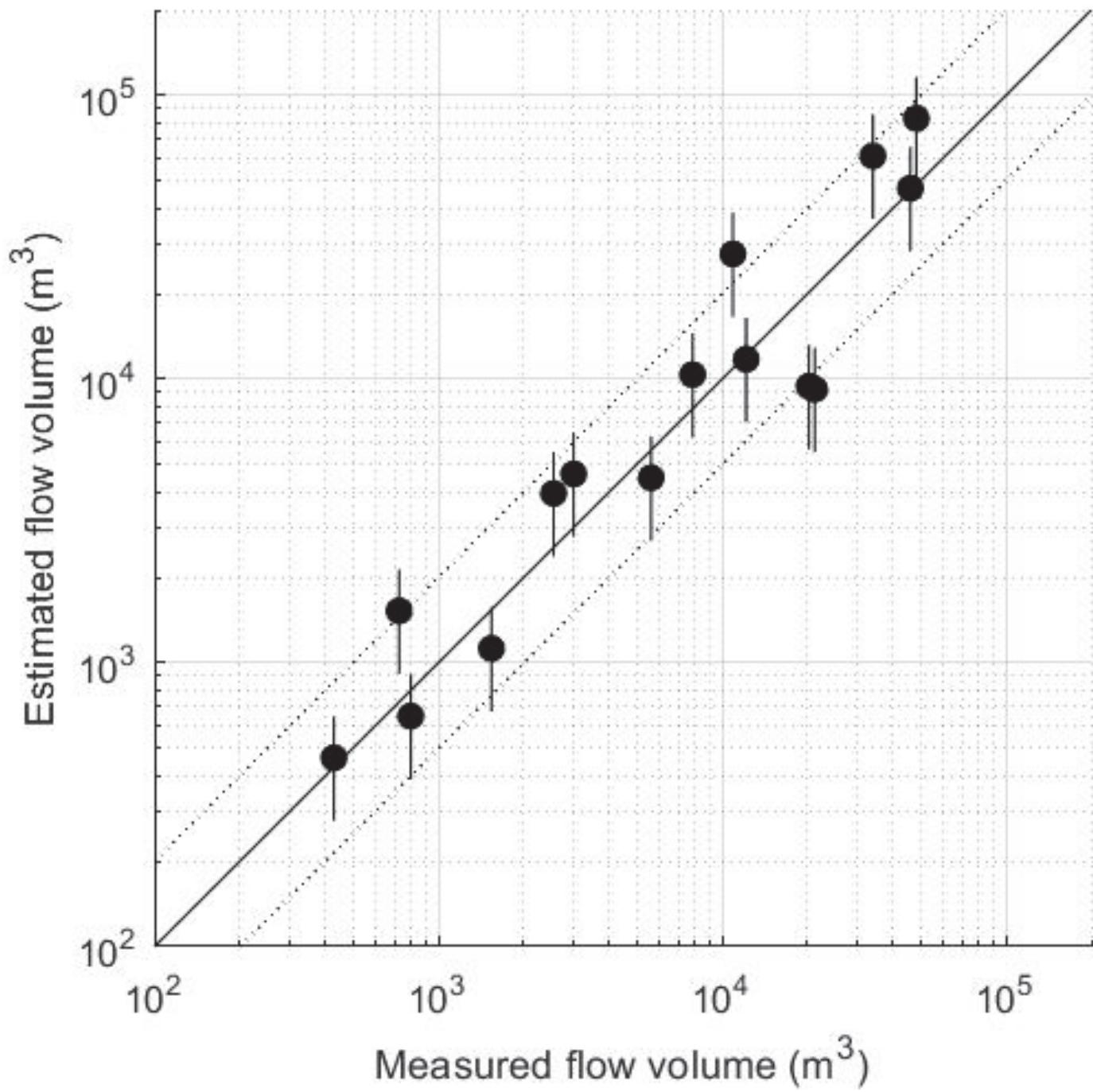


Fig. DR4

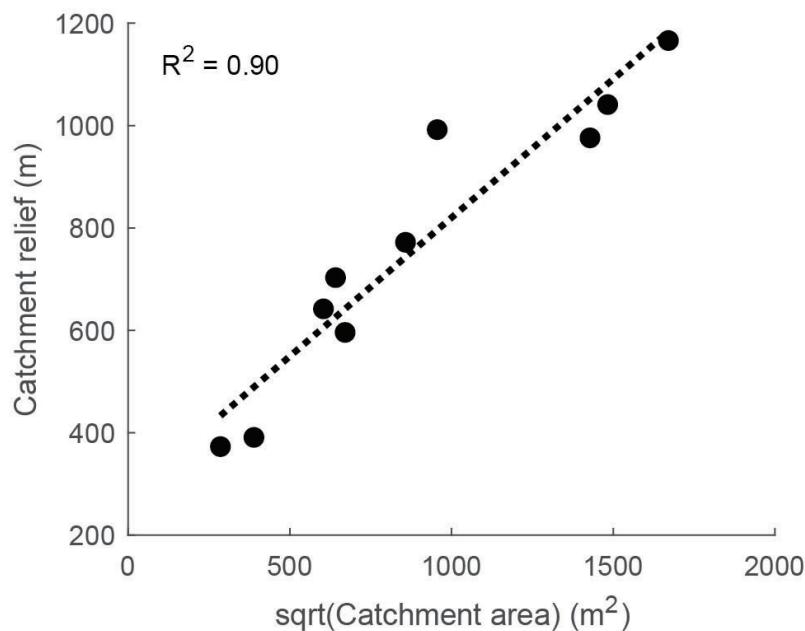
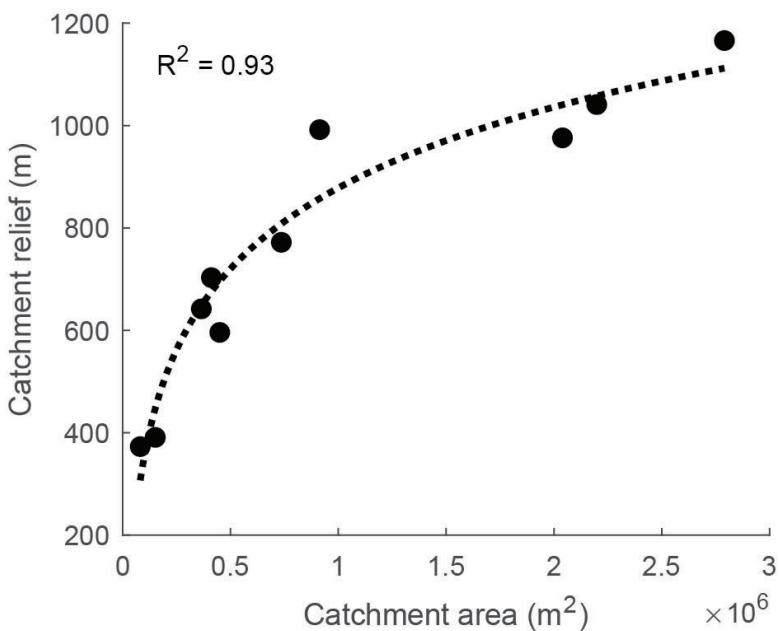
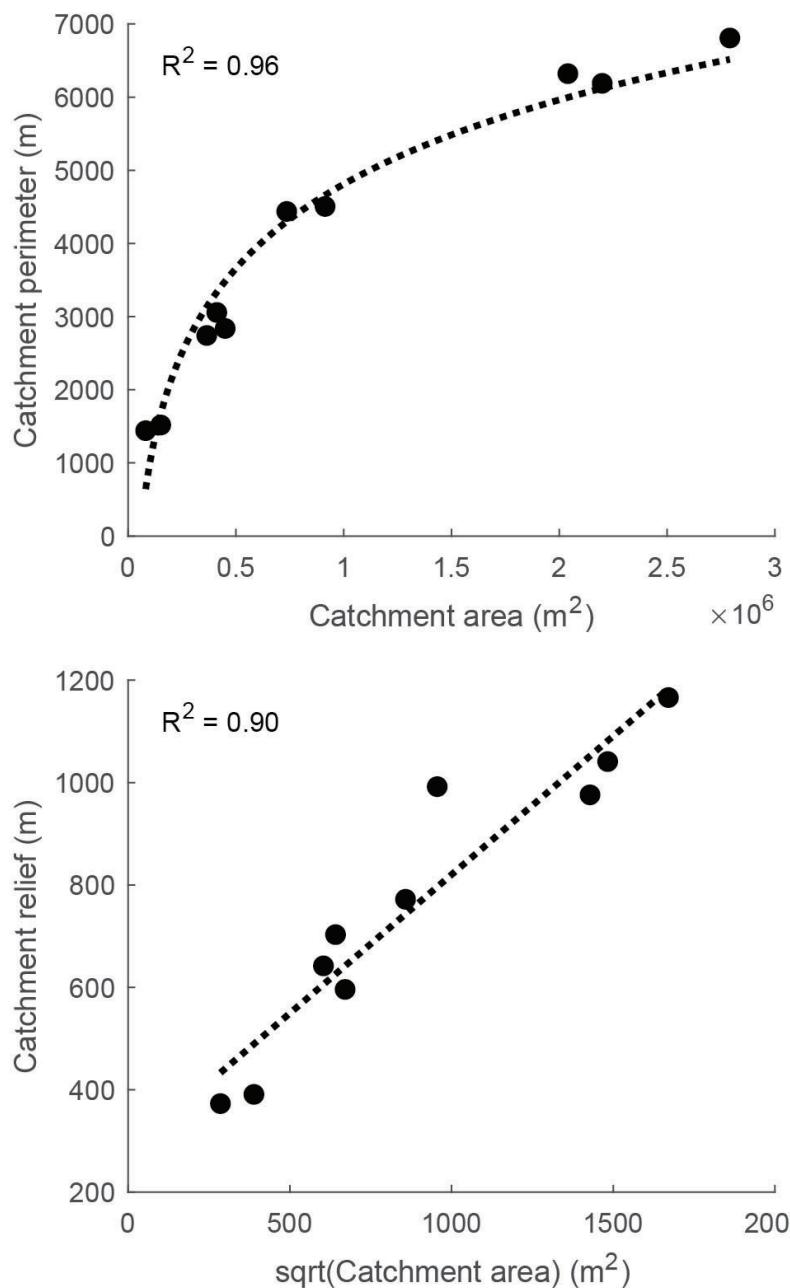
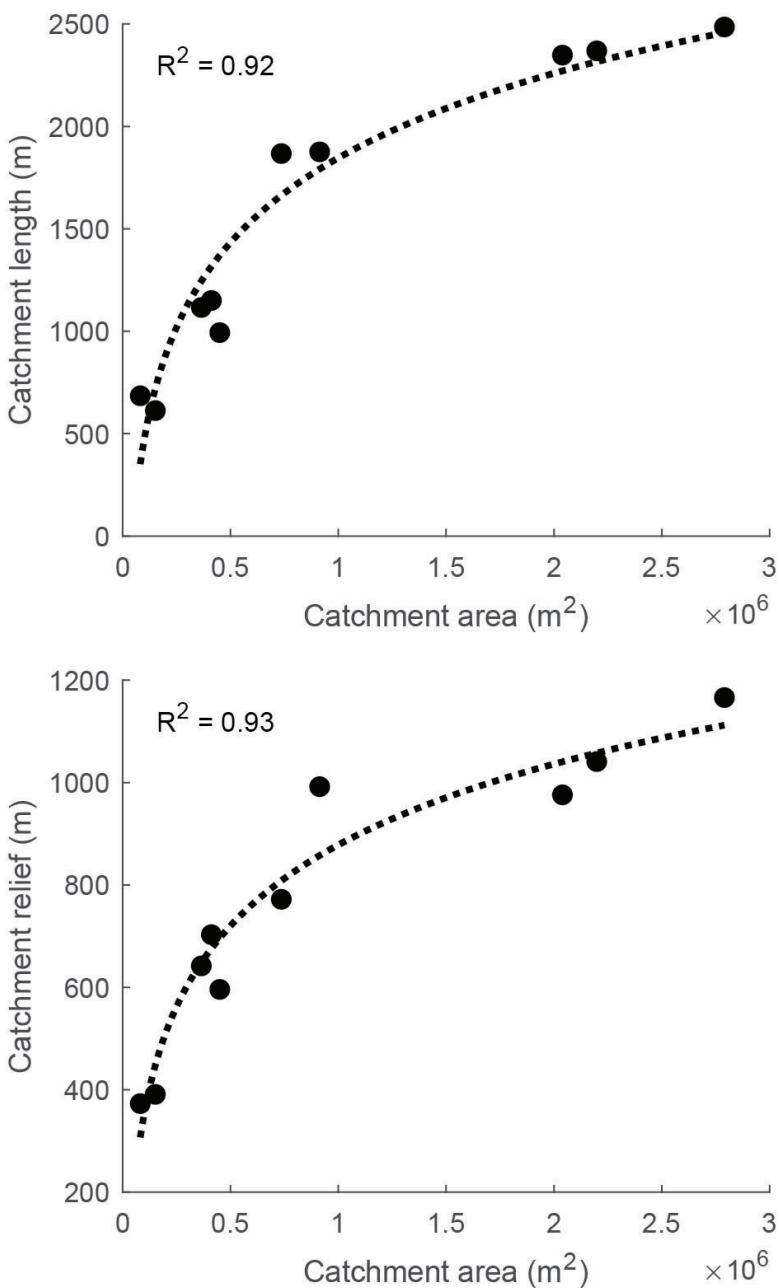


Table DR1: Results of linear regression ($y = ax+b$) between lobe-volume quantiles and catchment characteristics. The bold numbers highlight statistically significant results ($p<0.05$).

Catchment variable	Volume quantile	a	b	R ²	p
Area	25	6.44x10 ⁻⁵	128	0.35	0.07
	50	1.54x10⁻⁴	285	0.40	0.05
	75	3.76x10 ⁻⁴	930	0.21	0.18
	99	8.98x10 ⁻³	10131	0.32	0.09
	max.	1.63x10 ⁻²	34872	0.26	0.14
	mean	5.42x10 ⁻⁴	1020	0.34	0.08
Relief	25	2.27x10 ⁻¹	19	0.35	0.07
	50	5.45x10⁻¹	24	0.40	0.05
	75	1.53x10 ⁰	138	0.28	0.11
	99	3.95x10¹	-10966	0.50	0.02
	max.	7.93x10¹	-9294	0.49	0.03
	mean	2.49x10⁰	-333	0.57	0.01
Length	25	8.71x10 ⁻²	58	0.36	0.07
	50	2.04x10⁻¹	125	0.39	0.05
	75	5.61x10 ⁻¹	442	0.26	0.13
	99	1.59x10¹	-5389	0.56	0.01
	max.	2.73x10¹	9072	0.40	0.05
	mean	9.04x10⁻¹	168	0.52	0.02
Perimeter	25	3.36x10⁻²	60	0.40	0.05
	50	7.94x10⁻²	124	0.44	0.04
	75	2.17x10 ⁻¹	446	0.30	0.10
	99	5.40x10⁰	-2275	0.48	0.03
	max.	1.02x10¹	10792	0.42	0.04
	mean	3.24x10⁻¹	278	0.50	0.02
Slope	25	-8.38x10 ⁰	467	0.19	0.20
	50	-1.92x10 ¹	1066	0.20	0.20
	75	-4.26x10 ¹	2700	0.09	0.40
	99	-1.44x10 ³	66080	0.27	0.13
	max.	-1.52x10 ³	100835	0.07	0.46
	mean	-6.04x10 ¹	3540	0.13	0.30
Meltot ratio	25	-3.51x10²	522	0.47	0.03
	50	-8.27x10²	1217	0.51	0.02
	75	-2.38x10 ³	3541	0.38	0.06
	99	-4.14x10 ⁴	58098	0.30	0.10
	max.	-9.21x10 ⁴	137743	0.36	0.07
	mean	-2.74x10 ³	4144	0.38	0.06
Relief ratio	25	-5.82x10 ²	498	0.22	0.17
	50	-1.25x10 ³	1093	0.20	0.20
	75	-3.47x10 ³	3127	0.14	0.29
	99	-1.28x10⁵	86184	0.49	0.02
	max.	-1.57x10 ⁵	133539	0.18	0.22
	mean	-5.86x10 ³	4637	0.30	0.10
Form factor	25	4.86x10 ²	32	0.21	0.18
	50	1.24x10 ³	29	0.27	0.13
	75	3.51x10 ³	145	0.19	0.21
	99	1.67x10 ³	18679	0.00	0.98
	max.	1.12x10 ⁵	14175	0.12	0.32
	mean	2.37x10 ³	783	0.07	0.47
Elongation ratio	25	4.68x10 ²	-108	0.20	0.19
	50	1.21x10 ³	-335	0.26	0.13
	75	3.38x10 ³	-866	0.18	0.22
	99	3.12x10 ³	17230	0.00	0.96
	max.	1.10x10 ⁵	-19071	0.12	0.32
	mean	2.36x10 ³	53	0.07	0.47
Circularity index	25	1.59x10 ²	93	0.03	0.62
	50	4.53x10 ²	154	0.05	0.53
	75	8.16x10 ²	794	0.01	0.74
	99	-1.05x10 ⁴	25913	0.01	0.83
	max.	6.36x10 ³	47361	0.00	0.95
	mean	2.15x10 ²	1433	0.00	0.94