Supplementary file

Distribution fitting procedure

Clauset et al. (2009) and Rizzo et al (2017) proposed that the maximum likelihood estimator (MLE) should be preferred over use of least square regression analyses (R^2) for the fitting of power-law distributions. Rizzo et al. (2017) performed the MLE on power-law, log-normal and exponential distributions by using a suite of custom MATLAB™ functions, integrated into FracPaQ (Healy et al., 2017). The MLE approach maximizes the likelihood, gives estimate of the governing parameters (α for power-law distribution, λ for exponential distribution and μ and σ for the log-normal distribution) of the different fitting equations:

Power-law: $$p(x|\alpha) = \frac{\alpha-1}{x_{\min}}\left(\frac{x}{x_{\min}}\right)^{-\alpha}$$ Eq. 1

Log-normal: $$p(x|\mu,\sigma) = \frac{1}{x\sigma\sqrt{2\pi}}\exp\left(-\frac{(\ln x-\mu)^2}{2\sigma^2}\right)$$ Eq. 2

Exponential: $$p(x|\lambda) = \lambda\exp(-\lambda x)$$ Eq. 3

where $x_{\min}$ in the power-law distribution, is a required parameter representing the lower bound below which the power-law distribution is not valid (Clauset et al., 2009). The $x_{\min}$ parameter can be estimated using the Kolmogorov-Smirnoff (KS) test which minimizes the difference between the data and the synthetic data generated using the parameters derived from the MLE (Clauset et al., 2009; Rizzo et al., 2017). The K-S test generates an H-percentage (HP) which is the probability of accepting the H0 (null hypothesis) result over the total *n*-cycles (in this case $n = 2500$). If the *p*-value is less than or equal to 0.05, the test suggests that “the observed data are inconsistent with the null hypothesis, so the null hypothesis must be rejected, while if the *p*-value is far from zero and close to 1, the observed data are not inconsistent with the null hypothesis, and the chosen fitting method can be applied” (Light et al., 2009). However having a *p*-value larger than 0.05, does not prove that the tested hypothesis is the most appropriate distribution. Clauset et al. (2009) suggest that the *p*-value for alternative distributions can be calculated to test between other possible distributions. We used the KS probability value (reported in tables S2 & S2) to decide between log normal and power law distributions. In almost all examples, the exponential fit yielded a noticeably poorer result so is discounted.

Knowing that attributes collected from outcrop are naturally affected by truncation and censoring bias, we also performed the MLE and KS test for truncated populations defined by step-wise removal of data values from either end of the distribution (Fig. S1). We term these the upper cut (uc) and lower cut (lc) respectively. 40 values of censoring and truncation for uc and lc were considered, resulting in 800 simulations. The resulting values of KS values were visualized a checkerboard-like plots (e.g. Fig S1). The best-fit results produce the highest percentage values red colours in Fig 5.

In Table S1 and S2 we report the KS value (HP), and distribution coefficients obtained using the MLE for both non-truncated (power-law distributions) and for truncated (power-law distribution, exponential and log normal) populations aperture and length.

Complete (non-truncated) populations are generally best described by a log-normal distribution (they show consistently high percentage fitting values). However, the KS values for truncated log-normal and truncated power-law datasets are similar suggesting either distribution might be preferred. The choice of the best-fit distribution should not be based on complete population because population “end-points” (blue regions in Fig S1) are biased. For the datasets the aperture data can mostly be well describe by power-law distribution whereas the length data could be described by either power-law or log normal distributions.

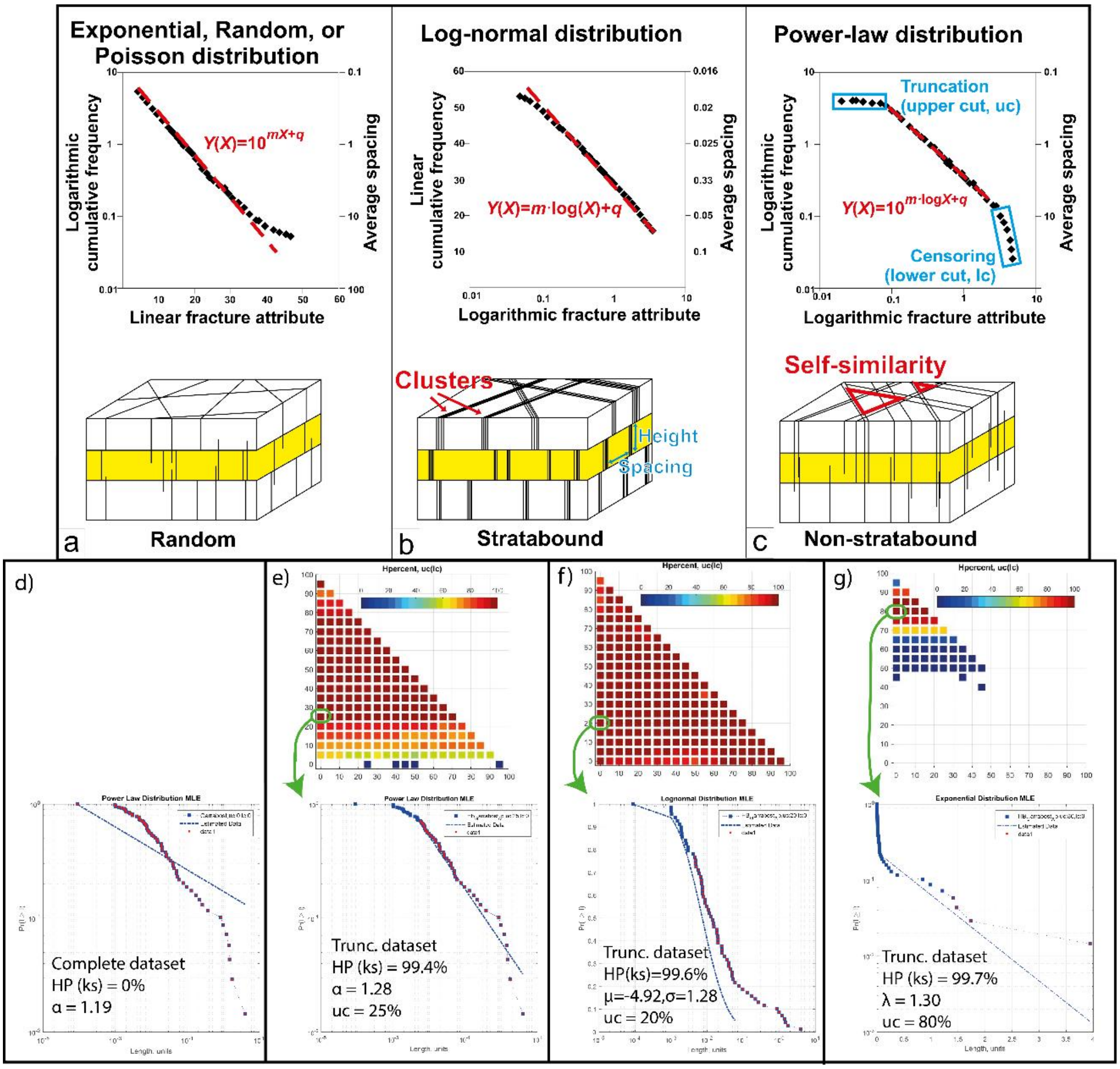

Fig S1. Example fracture distributions and models that show their typical development (after Dichiarante et al In Review) a) An exponential or random distribution, b) a log-normal distribution producing fracture corridors and c) a scale invariant power law distribution. d) an example of the modified Rizzo et al (2017) MLE distribution fitting procedure for a basement outcrop dataset from Garrabost, Hebrides. Complete dataset shows a poor power law fit, e) same dataset with a truncated (25%) picked as the minimum value of uc/lc from checkerboard of KS results that gives a good fit (>99% Ks value – dark red colour). f) the log-normal result for same dataset and g) the exponential result. All of the these fits are acceptable, however the exponential can be dismissed as 80% of the data have been removed from the analysis, the power law and log normal are very close with a slight preference for the log normal distribution (slightly higher KS value and slightly more of the data included.

Table S1 - Fracture Aperture data - distribution fitting parameters

	Mainland Lewisian										
Dataset	**AnB002**	**Assynt3 L1**	**Assynt ft**	**Assynt Shore_L1**	**CaolasCum**	**Clachtoll**	**Gruinard2**	**Gruinard**	**KLB_10**	**KLB_1**	**KLB_2**
Grid Reference	NC 0508 2624	NC 2006 2582	NC 2101 2510	NC 2028 2559	NC 2251 3392	NC 0425 2677	NG 8625 9097	NG 8625 9097	NC 2296 5621	NC 2296 5621	NC 2296 5621
Transect Orientation	102	242	139	158	53	169	152	152	167	280	316
Lithology	*Banded grey, medium grained orthogneisses*	*High grade intermediate to mafic orthogneisses*	*High grade intermediate to mafic orthogneisses*	*High grade intermediate to mafic orthogneisses*	*Grey acid orthogneisses*	*Banded grey, orthogneisses (intermediate to mafic), Canisp Shear fabrics*	*Granulite facies TTG gneisses*	*Granulite facies TTG gneisses*	*Light to dark grey diorite/granodiorite gneiss, with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneiss, with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneiss, with younger mafic pods. Granite and pegmatite intrusions*
Structure	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, little pre-existing structure*	*Assynt terrane, Canisp Shear zone margin*	*Gairloch shear zone fabrics*	*Gairloch shear zone fabrics*	*Rhicconich terrane, close to Kinlochbervie fault*	*Rhicconich terrane, close to Kinlochbervie fault*	*Rhicconich terrane, close to Kinlochbervie fault*
Number of fractures	208	53	50	42	50	65	76	76	81	94	61
Length (m)	12.728	8	3.25	6	113	14.5	50	15	20	35	30
										Power law fit for entire sample	
PL Prob	0	78.08	0.12	96.8	0	34.96	0	0	12.48	12.48	5.52
PL α	1.47	2.03	1.37	2.07	1.45	1.42	1.45	1.59	1.68	1.68	1.56
uc	0	0	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0	0	0
									Truncated and censored sample distribution fitting Using MLE approach (see text)		
LN Prob	98.92	**99.2**	**99.36**	**99.44**	98.12	98.4	96	96.44	**98.96**	98.04	98.64
LN mu	-1.41	**-0.45**	**-0.51**	**-0.14**	-5.78	-5.47	-4.98	-5.46	**-4.53**	-3.95	-5.52
LN sigma	0.30	**0.22**	**0.72**	**0.55**	0.25	0.81	0.73	1.10	**1.09**	2.33	0.49
uc	25	**65**	**0**	**0**	10	15	0	0	**0**	0	10
lc	20	**0**	**0**	**0**	85	25	90	70	**80**	75	50
Exp prob	0.04	24.08	52.92	0.80	97.64	99.60	83.80	97.36	0.00	0.00	4.72
Lambda	2.75	1.58	1.39	541.97	89.55	6.38	128.21	97.56	148.62	71.73	153.65
uc	0	0	0	0	95	95	95	85	0	0	0
lc	55	10	60	20	0	0	0	0	0	0	0
PL Prob T&C	**98.84**	98.12	99.56	98.56	**99.96**	**99.48**	**97.88**	**99.4**	97.44	**98.72**	**98.8**
PL α	**2.36**	3.22	3.21	2.32	**1.93**	**1.81**	**2.81**	**2.06**	2.01	**1.75**	**2.11**
xmin	**0.23**	1.45	0.63	0.74	**0.005**	**0.002**	**0.003**	**0.004**	0.004	**0.004**	**0.003**
uc	**40**	65	45	35	**95**	**40**	**90**	**85**	85	**75**	**60**
lc	**0**	0	5	2	**0**	**0**	**0**	**0**	1	**0**	**0**

	Mainland Lewisian (contd)									
Dataset	**KLB_L1**	**Lagg_Fish**	**Loch Inver**	**OSM**	**Shegra2**	**Shegra**	**Skerricha**	**TACperp2**	**TACperp**	**TTr2A**
Grid Reference	NC 2296 5621	NC 0835 3097	NC 1000 2357	NC 2010 5832	NC 1804 6027	NC 1801 6004	NC 2462 5100	NC 4510 6577	NC 4510 6577	NC 4510 6577
Transect Orientation	280	135	228	58	307	93	141	62	266	350
Lithology	*Light to dark grey diorite/granodiorite gneiss, with younger mafic pods. Granite and pegmatite intrusions*	*High grade intermediate to mafic orthogneisses*	*Amphibolite-grade banded grey quartz diorite and tonalite gneisses with Scourie dykes*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pod*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*
Structure	*Rhicconich terrane, close to Kinlochbervie fault*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich Terrane, perpendicular to foliation*	*Rhicconich Terrane, parallel to foliation*	*Rhicconich Terrane, perpendicular to foliation*
Number of fractures	81	47	72	53	83	51	77	107	57	43
Length (m)	30	9	20	13	30	20	40	30	20	20
PL Prob	80.76	0	3	87.88	0	0	0.08	0	0	68.08
PL α	1.93	1.88	1.67	1.50	1.44	1.62	1.52	1.43	1.45	1.96
uc	0	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0	0
LN Prob	83	99.84	**99.52**	99.72	**99.72**	**98.28**	99.84	99.64	99.24	**99.88**
LN mu	-0.11	-57916.00	**-6.07**	-3.44	**-4.95**	**-6.45**	-8.63	-6.03	-4.57	**-0.66**
LN sigma	0.83	0.33	**0.75**	0.83	**0.91**	**0.43**	0.66	0.27	0.43	**0.30**
uc	0	15	**30**	5	**0**	**10**	80	15	5	**30**
lc	0	65	**50**	75	**75**	**65**	15	75	70	**15**
Exp prob	24.64	94.88	85.36	99.64	74.76	0.00	71.44	97.20	97.28	14.96
Lambda	0.83	104.00	36.36	15.79	100.78		190.48	90.00	20.20	1.87
uc	0	75	0	75	85	100	95	85	95	0
lc	0	10	0	5	0	0	0	5	0	45
PL Prob T&C	**95.72**	**99.84**	99.48	**99.84**	99.92	96.16	**99.8**	**99.88**	**99.76**	99.84
PL α	**2.03**	**2.15**	1.81	**1.66**	2.00	1.64	**2.54**	**2.08**	**2.39**	3.37
xmin	**0.37**	**0.002**	0.006	**0.007**	0.01	0.0005	**0.007**	**0.004**	**0.01**	0.83
uc	**5**	**65**	87.5	**70**	90	55	**95**	**85**	**85**	65
lc	**1**	**10**	0	**10**	0	20	**0**	**0**	**5**	0

	Hebrides															
Dataset	Borve1	Borve 2	DailBeag	Garrabost	GobThais	Hushinish	Orasaigh	Pabail	PortMholair	Seaforth	SeisPara	SeisPerp	SHSZ1	SHSZ2	SHSZ3	Tolstadh
Grid Reference	NG 0387 9645	NG 0388 9755	NB 2274 4601	NB 5104 3308	NB 5354 5005	NA 9936 1190	NB 3766 3944	NB 5328 3124	NB 5647 3628	NB 1925 1188	NB 5593 3300	NB 5593 3300	NF 9864 8946	NF 9864 8946	NF 9867 8943	NB 5412 4618
Transect Orientation	40	330	64	260	160	170	268	72	249	62	136	32	147	33	120	95
Lithology	Banded gneiss and granite. Outside OHFZ.	Banded gneiss (adjacent to granite). Outside OHFZ	Banded Gneiss. Outside the OHFZ.	Banded gneiss near the OHFZ.	Banded gneiss. Outside the OHFZ.	Granitic gneiss, adjacent to large NNW-SSE trending lineament.	Banded gneiss, within OHFZ.	Banded gneiss within OHFZ, adjacent to NNW-SSE Mesozoic fault with several ms of gouge.	Banded gneiss and granite, outside the OHFZ.	Banded gneiss, outside the OHFZ. Along road cut.	Banded gneiss, within the OHFZ.	Banded gneiss within the OHFZ.	Foliation parallel within met	Banded gneiss	Banded gneiss.	Within the 'crush mélange' of the OHFZ – very heavily fractured cataclastic gneiss.
Structure	Pre-Mesozoic faults and joints.	Pre-Mesozoic faults and joints.	Joint dominated fracture set striking NW-SE.	Mesozoic fault dominated, NNW-SSE and N-S striking faults.	Joint dominated.	Calcite vein and joint dominated	Sub-parallel with late E-W faults, joints and veins	Mesozoic calcite cemented minor fault dominated	Epidote bearing faulting and background jointing	Dominated by jointing (50 m from the Seaforth Fault)	Mesozoic fault dominated - perpendicular to main fault	Joint dominated - parallel to main fault	Joint dominated	Joint dominated	Joint dominated adjacent to NNE-SSW striking fault	Fractures within cataclastic gneiss, cut by Mesozoic structures
Number of fractures	186	233	67	83	62	107	220	61	145	167	66	50	166	61	69	199
Length (m)	88.58	33.9	20.64	435.5	23.47	9.9	31.48	10.63	33.72	44.54	13.75	24.14	9.36	8.72	2.98	4.735
									Power law fit for entire sample							
PL Prob	0	0	0.08	0	0	0	0	12.48	0	1.2	0.76	0	0	0.76	0	0
PL α	1.3717	1.574	1.2833	1.1886	1.6165	1.435	1.3892	1.6841	1.4068	1.3296	1.3515	1.2084	1.0299	1.614	1.7086	1.2349
uc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
								Truncated and censored sample distribution fitting Using MLE approach (see text)								
LN Prob	99.52	98.32	99.6	99.6	96.08	97.52	97.4	94.4	97.36	93.44	91.88	95.72	95	99.68	99.32	95.64
LN mu	-5.7989	-10.329	-2.7422	-4.9169	-5.7669	-9.8716	-4.7767	-6.6067	-4.9476	-7.9531	-6.6272	-9.1982	-9.7692	-6.7656	-5.7875	-8.1019
LN sigma	1.0609	0.3738	0.92682	1.2833	0.72002	0.40806	1.3881	2.4468	1.2022	1.1037	0.34555	2.1508	0.14786	2.0896	0.58527	0.9286
uc	80	90	0	20	0	80	80	55	0	50	25	75	85	0	0	5
lc	0	0	60	0	85	0	0	0	75	20	25	5	5	70	90	75
Exp prob	97.16	97.88	99.2	99.72	94.36	99.96	97.12	99.6	99.52	99.96	77.8	100	99.04	100	93.96	22.72
Lambda	221.4325	101.3418	12.8907	1.3039	210.5263	16.3436	12.3069	19.8691	67.8075	65.8243	441.5748	3.5706	91.5858	100.4114	633.065	26.832
uc	80	95	55	80	95	95	95	85	80	95	0	95	95	85	70	95
lc	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
PL Prob T&C	97.32	98.08	98.32	99.4	100	92.24	89.72	97.72	98.4	100	92.8	96.84	98.08	99.28	95.32	96
PL α	1.7831	1.8576	2.11	1.4653	2.2459	1.6058	1.5961	1.379	1.6714	1.6093	2.053	1.6251	1.6785	1.504	2.1102	1.5361
xmin	0.00084524	0.00098481	0.04	0.0046985	0.003	0.0005	0.0027189	0.000096593	0.00093969	0.0019924	0.00086603	0.003	0.00096593	0.00096593	0.00096593	0.00025
uc	80	90	70	25	95	80	85	55	65	95	30	85	90	85	85	80
lc	0	0	5	0	0	0	0	0	0	0	20	2	0	0	0	0

	Clair										
Aperture	JP2067a_2	JP2067a_2core3	JP2067a_2core4	JP2067a_2core5	JP2067a_2core6	JP2067a_2core8	JP2067a_2core9	JP2068_8	KM2067a_2core3	KM2067a_2core 4	KM2067a_2core 8
Grid Reference	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Transect Orientation	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal	horizontal
Lithology	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss	Banded gneiss
Structure	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss	Fractured gneiss
Number of fractures	78	45	34	36	20	23	22	33	132	131	45
Length (m)	10	10	10	10	10	10	10	10	10	10	10
						Power law fit for entire sample					
PL Prob	1.8	50.28	82.12	47.8	97.96	76.48	86.04	86.68	0	0	65.44
PL α	1.31	1.32	1.42	1.31	1.41	1.35	1.33	1.37	1.25	1.24	1.32
uc	0	0	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0	0	0
						Truncated and censored sample distribution fitting Using MLE approach (see text)					
LN Prob	99.6	99.64	99.6	98.56	100	99.6	99.48	99.68	99.24	99.36	99.76
LN mu	-5.3	-5.588	-5.88	-6.1	-6.8735	-6.491	-6.31	-5.87	-7.92	-7.19	-5.59
LN sigma	1.38	1.577	1.33	1.39	0.91	1.32	1.49	1.45	0.71	0.8001	1.58
uc	0	0	0	0	30	0	0	0	35	20	0
lc	0	0	0	0	0	0	0	0	20	20	0
Exp prob	94.68	97.96	96.84	96.8	99.4	98.44	88.76	96.4	97.08	81.76	97.64
Lambda	90.93	75.89	154.92	91.52	87.71	300.43	181	119.68	97.07	346.34	75.89
uc	5	25	10	60	30	10	10	20	85	40	25
lc	0	0	0	0	0	0	0	0	0	0	10
PL Prob T&C	97.4	97.5	97.88	95.56	99.8	99.04	98.04	99.16	99.6	99.76	96.28
PL α	1.88	1.97	1.74	1.61	1.58	1.52	1.56	1.54	1.892	2.16	1.52
xmin	0.0047	0.0065	0.019	0.0007	0.0007	0.0003	0.0006	0.0008	0.0007	0.003	0.001
uc	45	60	35	15	30	10	20	20	55	85	20
lc	0	10	0	0	0	5	10	10	0	0	15

Table S2 Fracture length attributes - distribution fitting parameters

Mainland Lewisan

1D Length (P11)	ML_AchmelvichBeach_L1	ML_AnB3_L1	ML_AnB6_L1	ML_AnB8_L1	ML_AnBFT002_L1	ML_Assynt3_L1	ML_Assyntft_L1	ML_Assyntshore_L1	ML_Clachtoll_L1	ML_CSZ2_L1
Dataset	**Achmelvich**	**Alltan na bradhan**	**Alltan na bradhan**	**Alltan na bradhan**	**Alltan na bradhan**	**Assynt**	**Assynt_fieldtrip location**	**AssyntShore_L1**	**Clachtoll**	**Canisp SZ**
Grid Reference	NC 0566 2498	NC 0508 2624	NC 0508 2624	NC 0508 2624	NC 0508 2624	NC 2006 2582	NC 2101 2510	NC 2028 2559	NC 0425 2677	NC 0528 2581
Transect Orientation	230	102	102	102	102	242	139	158	169	
Lithology	*High grade intermediate to mafic orthogneisses*	*Banded grey, medium grained orthogneisses*	*Banded grey, medium grained orthogneisses*	*Banded grey, medium grained orthogneisses*	*Banded grey, medium grained orthogneisses*	*High grade intermediate to mafic orthogneisses*	*High grade intermediate to mafic orthogneisses*	*High grade intermediate to mafic orthogneisses*	*Banded grey, orthogneisses (intermediate to mafic), Canisp Shear fabrics*	*Banded grey, orthogneisses (intermediate to mafic), Canisp Shear fabrics*
Structure	Background gneiss outside Cansip Shear zone	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, Canisp Shear zone margin*
number of fractures	44	43	43	40	208	53	50	42	65	38
length (m)	8.1	6	6	6	12.728	8	3.25	6	14.5	6
	Power law fit for entire sample									
PL Prob	17.88	72.68	68.88	98.44	0	76.68	0	96.36	51.72	96.44
PL α	1.4403	1.7352	1.9641	2.1124	1.4657	2.0321	1.3711	2.0743	1.9171	1.9718
uc	0	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0	0
Xmin										
	Truncated and censored sample distribution fitting Using MLE apparaoch (see text)									
LN Prob	**99.44**	98.28	**99.4**	**99.8**	**99.24**	**99.56**	99.32	**99.2**	**99.52**	**99.04**
LN mu	**-0.43992**	-0.10305	**-0.62487**	**-0.43023**	**-1.5519**	**0.40407**	-0.50601	**-0.0062706**	**-0.45417**	**-0.16581**
LN sigma	**0.90444**	0.63293	**0.5312**	**0.50431**	**0.49571**	**0.48127**	0.72165	**0.67445**	**0.41534**	**0.74359**
uc	**0**	10	**10**	**0**	**20**	**30**	0	**0**	**15**	**0**
lc	**0**	0	**0**	**0**	**0**	**0**	0	**0**	**0**	**0**
	100	*90*	*90*	*100*	*80*	*70*	*100*	*100*	*85*	*100*
Exp prob	96.44	95.52	4.52	*89.88*	26.44	2.84	50.88	19.84	65.84	81.04
Lambda	1.0916	0.24821	1.8881	0.51613	1.335	1.0041	1.3872	1.1318	0.43459	0.49648
uc	55	70	5	85	0	0	0	0	85	85
lc	0	5	0	0	5	0	60	85	5	0
	45	*25*	*95*	*15*	*95*	*100*	*40*	***15***	*10*	*15*
PL Prob T&C	98.48	**99.2**	98.12	98.44	99	98.48	**99.64**	98.52	98.72	98.48
PL α	2.3311	**2.0278**	2.3764	2.1124	2.3741	2.5943	**3.2061**	2.1675	2.3049	2.2797
xmin	0.584	**0.51**	0.35	0.31	0.217	0.8	**0.63**	0.5	0.49	0.53
uc	40	**10**	15	0	40	30	**45**	15	20	25
lc	0	**0**	0	0	5	0	**0**	5	0	0
	60	*90*	*85*	*100*	*55*	*70*	***55***	*80*	*80*	*75*

1D Length (P11)	ML_CSZ3_L1	ML_CSZmid_L1	ML_KLB_L1	ML_LochAssynt2_L1	ML_LochAssynt3_L1	ML_Oldshoremore1_L1	ML_Rispond_L1	ML_TraighAlltChailgeag_L1	ML_TTr2A_L1
Dataset	**Canisp SZ**	**Canisp SZ**	**Kinlochbervie**	**Loch Assynt Shore**	**Loch Assynt**	**Oldshoremore**	**Rispond**	**Traigh Allt Chailgeag**	**Traigh Allt Chailgeag**
Grid Reference	NC 0582 2559	NC 0581 2559	NC 2296 5621	NC 2028 2559	NC 2006 2582	NC 2010 5832	NC4508 6557	NC 4510 6577	NC 4510 6577
Transect Orientation	281		280	158	242	58	1	62	266
Lithology	*Banded grey, orthogneisses (intermediate to mafic), Canisp Shear fabrics*	*Banded grey, orthogneisses (intermediate to mafic), Canisp Shear fabrics*	*Light to dark grey diorite/granodiorit e gneiss, with younger mafic pods. Granite and pegmatite*	*High grade intermediate to mafic orthogneisses*	*High grade intermediate to mafic orthogneisses*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pod*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pod*	*Light to dark grey diorite/granodiorite gneisse, banded in places with younger mafic pods. Granite and pegmatite intrusions*	*Light to dark grey diorite/granodiorite gneisse, with younger mafic pods. Granite and pegmatite intrusions*
Structure	*Assynt terrane, Canisp Shear zone margin*	*Assynt terrane, Canisp Shear zone margin*	*Rhicconich terrane, close to Kinlochbervie fault*	*Assynt terrane, background gneiss fabrics*	*Assynt terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich terrane, background gneiss fabrics*	*Rhicconich Terrane, perpendicular to foliation*	*Rhicconich Terrane, parallel to foliation*
number of fractures	42	40	94	42	53	53	49	107	57
length (m)	6	6	35	6	8	13	24	30	20
PL Prob	87.92	94.56	79.92	96.16	78.52	76.6	80.96	71.64	56.56
PL α	1.6109	1.8465	1.9314	2.0743	2.0321	2.0127	1.7809	1.7415	1.9641
uc	0	0	0	0	0	0	0	0	0
lc	0	0	0	0	0	0	0	0	0
Xmin									
LN Prob	98.24	**99.6**	97.4	**99.04**	98.28	**99.76**	**99.32**	99.44	**99.4**
LN mu	0.14974	**0.40724**	-0.2328	**-0.0062706**	0.30408	**-0.15736**	**-0.18581**	-0.42471	**-0.62487**
LN sigma	0.76437	**0.64703**	0.64823	**0.67445**	0.5115	**0.37238**	**0.47237**	0.40024	**0.5312**
uc	15	**10**	15	**0**	20	**45**	**0**	40	**0**
lc	0	**0**	10	**0**	0	**0**	**0**	0	**0**
	85	*90*	*75*	*100*	*80*	*55*	*100*	*60*	*100*
Exp prob	95.8	52.92	85.64	18.96	3	73.92	59.24	55.88	16.8
Lambda	0.38642	0.83796	0.26683	1.1318	1.0041	0.4013	0.92983	0.60378	1.8724
uc	15	0	85	0	0	90	0	0	0
lc	0	10	0	55	0	0	25	0	0
	85	*90*	*15*	*45*	*100*	*10*	*75*	*100*	*100*
PL Prob T&C	**99.04**	99.64	**98.64**	98.48	**98.6**	98.48	98.76	**99.36**	98.68
PL α	**1.7625**	2.7298	**2.1977**	2.3197	**2.3863**	3.7526	2.3236	**2.0629**	2.3764
xmin	**0.545**	1.32	**0.5**	0.74	**0.67**	1.57	0.74	**0.78**	0.35
uc	**10**	55	**20**	35	**15**	55	35	**35**	15
lc	**5**	0	**5**	5	**5**	0	0	**0**	0
	85	*45*	*75*	*60*	*80*	*45*	*65*	*65*	*85*

Clair regional length datasets

	CL_EW2_L1	CL_NS1_L1	CL_NS2_L1	CL_NW-SE2_L1	CL_NE-SW1_L1	CL_NE-SW2_L12
Dataset	Clair seismic attribute	Clair seismic attribute	Clair seismic attribute	Clair seismic attribute	Clair seismic attribute	Clair seismic attribute
Grid Reference	n/a	n/a	n/a	n/a	n/a	n/a
Transect Orientation		0	0	315	45	45
Lithology	*Lewisian Gneisses*	*Lewisian Gneisses*	*Lewisian Gneisses*	*Lewisian Gneisses*	*Lewisian Gneisses*	*Lewisian Gneisses*
Structure	*Rona Ridge*	*Rona Ridge*	*Rona Ridge*	*Rona Ridge*	*Rona Ridge*	*Rona Ridge*
number of fractures	39	30	41	31	49	46
Length (m)	15 900	14 100	14 300	10 500	24 700	24 000
PL Prob	***97.2***	75.6	98.92	99.04	52.36	54.56
PL α	***1.91***	1.61	1.89	1.72	1.97	1.66
uc	***0***	0	0	0	0	0
lc	***0***	0	0	0	0	0
LN Prob	***98.04***	**99.92**	96.76	98.96	**97.48**	**99.84**
LN mu	***7.33***	**7.49**	7.28	7.3	**7.25**	**6.9982**
LN sigma	***0.74***	**0.9**	0.85	0.97	**0.6**	**0.55**
uc	***5***	**0**	0	0	**0**	**45**
lc	***0***	**0**	0	0	**0**	**0**
Exp prob	***95***	99.2	76.24	97.96	4.4	69
Lambda	***0.00013***	0.00039	0.00053	0.00044	0.00083	0.0005
uc	***90***	0	0	0	0	0
lc	***0***	0	0	0	0	0
PL Prob T&C	***98.2***	98.4	**98.92**	**99.04**	94.96	99.44
PL α	***1.92***	2.1	**1.89**	**1.72**	2.43	3.29
xmin	***626***	1114	**515**	**412**	793	2075
uc	***5***	30	**0**	**0**	10	45
lc	***0***	0	**0**	**0**	15	0

Regional-scale length data (2D)

	HB_Hebrides_L2	ML_Assynt_L2	ML_Rhiconich_L2	ML_Scourie_L2
Dataset				
Grid Reference	n/a	n/a	n/a	n/a
Transect Orientation	---	---	---	---
Lithology	*Lewisian Gneisses*	*of Assynt terrane*	*terrane*	*terrane*
Structure	*basement fabrics and faults*	*basement fabrics and faults*	*basement fabrics and faults*	*basement fabrics and faults*
number of fractures	1743	2233	835	918
Area (km2)	2179	21.3	108.2	113.7
PL Prob	0	0	0	0
PL α	1.7382	1.316	1.1949	1.2322
uc	0	0	0	0
lc	0	0	0	0
LN Prob	**97.36**	**96.44**	98.36	96.04
LN mu	**6.9597**	**6.1499**	6.3272	6.1015
LN sigma	**0.67701**	**0.44067**	0.12044	0.33314
uc	**60**	**15**	30	20
lc	**15**	**5**	40	5
Exp prob	0	0	0	0
Lambda	-	-	-	-
uc	-	-	-	-
lc	-	-	-	-
PL Prob T&C	97.16	95.48	**98.52**	**98.16**
PL α	3.1362	3.32	**3.0059**	**2.7443**
xmin	1753.9192	1470.4323	**647.7691**	**491.8053**
uc	75	90	**65**	**50**
lc	0	0	**0**	**1**
	25	*10*	*35*	*49*

Sample No	Sample Area	Total Trace-length	I	Y	X	E	Total	No. Lines	No. Branches	Average Line Length	Avge Branch Length	Connect/line	Connect/branch	Frequency	Intensity
AnB T1b	716743.2549	16881.43844	134	168	21	45	323	151	361	111.80	46.76	2.50	1.63	0.0005	0.024
AnB T2	364893.8289	11509.77525	90	215	68	43	373	152.5	503.5	75.47	22.86	3.71	1.82	0.0014	0.032
AnB T3	785397.5	19634.95408	55	277	28	50	360	166	499	118.28	39.35	3.67	1.89	0.0006	0.025
AnB T4	502654.4	14765.48547	34	238	14	47	286	136	402	108.57	36.73	3.71	1.92	0.0008	0.029
AnB T5	125663.6	6911.503838	31	341	22	44	394	186	571	37.16	12.10	3.90	1.95	0.0045	0.055
AnB T6	785397.5	16100.66235	42	171	8	41	221	106.5	293.5	151.18	54.86	3.36	1.86	0.0004	0.021
AnB T7a	1433720.525	29181.66511	58	360	25	55	443	209	619	139.63	47.14	3.68	1.91	0.0004	0.020
AnB T7b	1433720.525	32895.69522	73	574	61	62	708	323.5	1019.5	101.69	32.27	3.93	1.93	0.0007	0.023
AnB T8	2286419.986	36851.55531	69	280	29	55	378	174.5	512.5	211.18	71.91	3.54	1.87	0.0002	0.016
AnB T9	180523.8104	11672.77364	51	393	32	62	476	222	679	52.58	17.19	3.83	1.92	0.0038	0.065
AnB T10	275979.3576	14432.61802	62	405	20	62	487	233.5	678.5	61.81	21.27	3.64	1.91	0.0025	0.052
Clair 1 a	3061.875173	373.163	6	5	6	14	17	5.5	22.5	67.85	16.59	4.00	1.73	0.0073	0.122
Clair 1 b	3061.875173	402.862	9	17	4	12	30	13	38	30.99	10.60	3.23	1.76	0.0124	0.132
Clair 6	3061.875173	385.464	5	9	3	12	17	7	22	55.07	17.52	3.43	1.77	0.0072	0.126
Clair 1 c	3061.875173	697.436	6	52	6	24	64	29	93	24.05	7.50	4.00	1.94	0.0304	0.228
Clair 1 d	3061.875173	565.945	5	41	1	23	47	23	66	24.61	8.57	3.65	1.92	0.0216	0.185
Clair 2 a	3061.875173	612.268	8	35	7	18	50	21.5	70.5	28.48	8.68	3.91	1.89	0.0230	0.200
Clair 2 b	3061.875173	732.328	6	62	5	20	73	34	106	21.54	6.91	3.94	1.94	0.0346	0.239
Clair 2 c	3061.875173	326.205	6	10	2	5	18	8	22	40.78	14.83	3.00	1.73	0.0072	0.107
Clair2_d	3061.875173	361.948	2	17	0	13	19	9.5	26.5	38.10	13.66	3.58	1.92	0.0087	0.118
RR1	3061.875	679.536	2	39	6	22	47	20.5	71.5	33.15	9.50	4.39	1.97	0.0234	0.222
RR2	3061.875	421.048	5	30	0	17	35	17.5	47.5	24.06	8.86	3.43	1.89	0.0155	0.138
RR3	3061.875	763.406	5	63	6	24	74	34	109	22.45	7.00	4.06	1.95	0.0356	0.249
RR4	3061.875	1078.614	5	173	10	32	188	89	282	12.12	3.82	4.11	1.98	0.0921	0.352
RR5	3061.875	532.007	4	30	0	15	34	17	47	31.29	11.32	3.53	1.91	0.0154	0.174
RR6	3061.875	841.229	20	72	6	26	98	46	130	18.29	6.47	3.39	1.85	0.0425	0.275
Assynt Regional	3.03608E+13	188445192.4	246	194	161	82	601	220	736.00	856569.06	256039.66	3.23	1.67	0.0000	0.000