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Supplemental Material

Supplementary Material: Discharge Calculations

Supplementary Material: Stream power in the sedimentary units.

Supplemental methods – Selby Rock Mass Strength index

Supplemental methods – Grain size analysis

TABLE S1 - Akçapınar River

Downstream Distance, L (km)	Site	Drainage Area, A (km$^{2)}$)	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	hardness (Selby points value)	Lithology	Weathering (Selby points value)	joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)
0.94	1	0.83	38.40315	27.88466	863	0.9	0.5	0.035	0.225	0.2	78.7			72	57.8	20	gneiss	7	8	20	6	5	6
1.16	2	1.11	38.40293	27.88375	855	4.1	0.3	0.112	0.615	0.3	74.2			68	52.9	20	schist	5	8	18	6	5	6
1.49	3	1.71	38.40341	27.88047	819	3.8	0.3	0.021	0.570	0.4	23.0			64	48	18		7	8	14	6	5	6
1.7	4	1.87	38.40464	27.87835	799	5.3	0.7	0.054	1.855	0.5	46.7			74	67.4	20	mica schist	9	8	20	6	5	6
1.86	5	1.92	38.4044	27.87755	788	2.7	0.3	0.045	0.405	0.5	78.9	60.3	12.4	72	61.3	20	schist	9	8	18	6	5	6
2.12	6	2.39	38.40477	27.87459	734	5.1	0.85	0.141	2.168	0.6	161.0			68	58.1	18	schist	9	8	18	4	5	6
2.44	7	2.53	38.40517	27.87152	734	3.4	0.7	0.030	1.190	0.6	54.0			0									
2.76	8	2.63	38.40351	27.86864	720	3.1	0.85	0.037	1.318	0.7	76.0			72	67.85	20	schist	9	8	18	6	5	6
3.26	9	2.752	38.40338	27.86529	707	6.2	0.8	0.037	2.480	0.7	39.8			72	66.85	20	schist	9	8	18	6	5	6
3.55	10	7.67	38.40441	27.866233	703	4.6	0.9	0.016	2.070	1.9	64.0			64	48.85	14	schist	9	8	18	4	5	6
3.73	11	7.79	38.4058	27.86137	703	6.7	0.8	0.031	2.680	1.9	89.3			72	60.25	20	gneiss	9	8	18	6	5	6
4.04	12	9.98	38.40814	27.86299	688	6.7	1.6	0.044	5.360	2.5	158.9	91.9	24.5	66	50.2	18	schist	7	8	18	4	5	6
4.3	31	10.114	38.40956	27.86486	681	5.4	1.7	0.035	4.590	2.5	159.8			68	55.7	18	schist	7	8	18	6	5	6
4.6	32	10.35	38.41109	27.867	676	5.5	1.6	0.047	4.400	2.6	216.9			69	63.2	20	st with qtz	7	8	18	5	5	6
4.9*	33	11.64	38.41357	27.86793	673	5.9	1.4	0.044	4.130	2.9	210.5												
5.21	44	12.48	38.41633	27.86859	659	3.5	0.9	0.089	1.575	3.1	777.7			67	40.5	14	schist	9	8	18	6	6	6
5.67	43	12.72	38.42021	27.86904	624	3.7	1.6	0.052	2.960	3.2	440.3			70	58.45	18	schist	9	8	18	6	5	6
6.05	42	13.37	38.4233	27.8686	595	3.1	1.6	0.042	2.480	3.3	441.8	374.5	116.0										
6.61	41	13.81	38.42799	27.86759	547	4.1	1.2	0.047	2.460	3.4	388.2			52	38	10	schist	7	8	9	6	6	6
7.15	40	22.53	38.43143	27.86483	511	4.5	0.8	0.054	1.800	5.6	662.7			67	40.25	14	schist	9	8	20	5	5	6
7.68	39	23.15	38.43422	27.8601	497	3.8	1.1	0.056	2.090	5.8	832.4			60	38.15	10	schist	7	8	18	5	6	6
8.24	38	23.57	38.43457	27.85596	451	2.9	1.5	0.073	2.175	5.9	1458.6	756.7	215.4	65	42.1	14	gniess	9	8	18	5	5	6
8.59	37	26.81	38.4359	27.85315	425	4.1	0.6	0.065	1.230	6.7	1033.4			61	37	10	schist	7	8	20	5	5	6
9.01	36	26.47	38.43889	27.85152	390	5.7	0.5	0.049	1.425	6.6	555.1			49	37.3		schist	7	8	18	5	5	6
10.34	27	33.37	38.44873	27.852238	333	6.4	0.6	0.107	1.920	8.3	1361.8	1102.2	203.8	63	38.95	10	schist	7	8	20	6	6	6
10.58	26	34.37	38.4507	27.85187	319	6.1	0.9	0.098	2.745	8.6	1350.2			59	37.6	10	schist	7	8	18	5	5	6
10.83	25	34.52	38.45244	27.85232	299	3.2	1.2	0.072	1.920	8.6	1889.8			72	62.6	20	gneiss	9	8	18	6	5	6
11.02	24	34.67	38.45441	27.85224	280	3.7	0.9	0.068	1.665	8.6	1561.2			68	59.4	18	gneiss	7	8	18	6	5	6
11.29	23	35.67	38.45638	27.85246	280	4.1	0.6	0.033	1.230	8.9	705.3			72	62.4	20	gneiss	9	8	18	6	5	6
11.54	22	35.28	38.45836	27.85306	280	3.7	0.8	0.052	1.480	8.8	1221.2			72	61.2	20	gneiss	9	8	18	6	5	6
11.74	21	35.54	38.45987	27.85421	274	4.1	0.7	0.047	1.435	8.9	999.0			68	54.05	18	gneiss	7	8	18	6	5	6
12.03	20	35.83	38.462	27.8538	240	3.2	0.6	0.054	0.960	8.9	1482.0			68	53.25	18	gneiss	7	8	18	6	5	6
12.26	19	35.98	38.46404	27.8544	220	3.6	0.6	0.047	1.080	9.0	1151.9	1295.1	181.6										
12.52	18	41.76	38.46574	27.85381	215	9	0.4	0.084	1.800	10.4	952.2			75	53.85	18	gneiss	7	15	18	6	5	6
12.83	28	42.01	38.46812	27.85363	188	4.3	0.9	0.052	1.935	10.5	1251.3			77	63.6	20	gneiss	7	15	18	6	5	6
13.03	14	42.71	38.4682	27.85031	948	4.9	0.9	0.095	2.205	10.7	2013.6			58	46.2	10	schist	5	8	18	6	5	6
13.32	15	42.95	38.47046	27.849	948	5.2	0.8	0.082	2.080	10.7	1659.6			72	63.55	20	gneiss	9	8	18	6	5	6
13.77	16	43.52	38.47351	27.84659	157	5.6	0.5	0.072	1.400	10.9	1361.4			62	37.35	10	schist	7	8	20	5	6	6
14.12	17	43.71	38.47638	27.84567	149	5.6	0.6	0.052	1.680	10.9	999.7	1373.0	215.7	58	35.2	10	schist	5	8	18	5	6	6
14.6	30	44.38	38.48041	27.84481	131	4.8	0.5	0.056	1.200	11.1	1263.3			58	37.3	10	schist	5	8	18	6	5	6
14.98	29	46.5	38.4832	27.843	123	8	1	0.024	4.000	11.6	347.2			58	36.45	10	schist	5	8	18	6	5	6
15.04	13	46.6	38.48532	27.84035	121	6	3	0.002	9.000	11.6	33.1			55	34.25	5	schist	5	8	20	6	5	6
15.35	34	46.7	38.48702	27.8406	116	7.6	0.9	0.037	3.420	11.6	550.7												
15.49#	35	46.71	38.48828	27.84031	97	8.9	0.6	0.007	2.670	11.6	89.5	547.2	248.1	51	28.35	5	/deforme	5	8	18	4	5	6

[1] *Discharge values scaled to a regional A (km^2) : Q (m^3/s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.*

* *Nearest site upstream of knickpoint*

[#] *Nearest site upstream of fault*

TABLE S2 - Sartçay River

Downstream Distance, L (km)	Site	Drainage Area, A (km$^{2)}$)	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	hardness (Selby points value)	Lithology	Weathering (Selby points value)	joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)	D50 estimate of grain size (m)	MPM transport capacity (kg/s)
0.44	8	1.790	38.37468	27.97088	959	6	0.5	0.047	1.500	0.4	34.4														
0.90	9	2.218	38.37837	27.96863	957	1.1	0.3	0.021	0.165	0.6	103.2														
0.96	10	2.225	38.37887	27.96875	957	1.7	0.5	0.044	0.425	0.6	139.7														
1.26	11	2.793	38.38157	27.96974	953	1.5	0.5	0.030	0.375	0.7	135.1			63	48.6	14	mica schists	7	8	18	5	5	6		
1.62	12	3.406	38.38426	27.97061	941	2.2	0.6	0.024	0.660	0.8	92.5			63	49.15	14	schist	7	8	18	5	5	6		
2.12	13	3.718	38.38812	27.97161	936	2.7	0.5	0.035	0.675	0.9	117.5	103.7	19.2	59	20.25	5	Amphibolite Mica Schist	5	15	18	5	5	6		
2.56	14	4.035	38.39115	27.97188	912	5.5	0.9	0.073	2.475	1.0	131.7														
2.97	15	4.315	38.39443	27.97076	911	3.7	0.5	0.024	0.925	1.1	69.7			56	37.95	10	mica schist	5	8	18	5	4	6		
3.29	16	5.306	38.39696	27.97163	909	5.6	0.85	0.030	2.380	1.3	68.7			61	39.6	10	schist	9	8	18	5	5	6		
3.68	17	5.505	38.40004	27.97271	899	6.2	0.5	0.021	1.550	1.4	45.5			54	40	14	biotite hornblende	7	8	9	5	5	6		
4.06	18	5.795	38.40304	27.9742	886	3.2	0.45	0.019	0.720	1.4	85.0	86.3	16.3												
4.43	19	6.977	38.40567	27.97372	880	1.7	1.5	0.024	1.275	1.7	245.1			50	39.45	10	schist +marble conglomerate	7	8	9	5	5	6		
4.67	20	7.147	38.40837	27.97365	870	6	0.5	0.031	1.500	1.8	91.5			60	53.65	18	schist	9	8	9	5	5	6		
5.04	21	7.670	38.41123	27.97273	886	5.2	0.9	0.059	2.340	1.9	214.2			52	30	5	schist	5	8	18	5	5	6		
5.42	22	8.049	38.41316	27.96991	838	7.1	0.4	0.033	1.420	2.0	91.9			53	32.55	5	schist	7	8	18	5	4	6		
5.91	29	8.510	38.41617	27.96652	825	4.5	0.7	0.033	1.575	2.1	153.3	159.2	35.0	59	38.95	10	schist	7	8	18	5	5	6		
6.49	30	8.806	38.42005	27.96354	800	3.6	1	0.016	1.800	2.2	93.9			54	31.8	5	schist	7	8	18	5	5	6		
7.02	31	11.313	38.4244	27.96245	770	3.9	1.9	0.033	3.705	2.8	235.2			52	42	14	schist	5	8	9	5	5	6		
7.63	32	11.960	38.42935	27.96213	739	4.8	0.6	0.028	1.440	3.0	170.1	166.4	35.4	63	41.65	14	schist	7	8	18	5	5	6		
8.11*	33	12.310	38.43301	27.96468	711	5.2	0.7	0.051	1.820	3.1	293.1			63	46.3	14	schist	7	8	18	5	5	6		
8.80	34	13.191	38.43782	27.96772	657	5	0.6	0.117	1.500	3.3	757.4														
9.32	35	15.196	38.44168	27.97061	594	6.2	0.5	0.056	1.550	3.8	334.9			61	41.2	14	schist	5	8	18	5	5	6		
9.74	36	15.378	38.44493	27.97258	558	3.2	1.8	0.077	2.880	3.8	903.7	572.3	152.3												
10.24	37	17.106	38.44863	27.97523	526	4.8	1.6	0.063	3.840	4.3	547.9														
11.99	41	20.454	38.45902	27.98672	402	3.7	1.7	0.037	3.145	5.1	495.4														
12.22	40	21.694	38.466	27.98827	363	2.1	1.3	0.031	1.365	5.4	793.4	612.2	79.5	70	64.5	20	gneiss	9	15	9	5	6	6		
12.74	39	21.880	38.46316	27.99145	320	1.9	2.6	0.044	2.470	5.5	1228.8			76	60.85	20	gneiss	9	21	9	5	6	6		
13.25	38	22.598	38.46497	27.99576	256	2.6	1.8	0.063	2.340	5.6	1336.4			61	64.15	20	gneiss	7	8	9	5	6	6		
13.95	23	29.479	38.46625	28.00168	210	2.2	2.4	0.073	2.640	7.4	2404.8	1656.6	325.1	65	57.55	18	gneiss	7	15	9	5	5	6		
14.40	24	32.341	38.4671	28.0057	182	3.5	0.9	0.058	1.575	8.1	1302.1			70	68.55	20	gneiss	9	15	9	5	6	6		
14.87	25	33.534	38.46825	28.01003	172	3.9	2.5	0.023	4.875	8.4	476.9			58	36.65	10	schist	7	15	9	5	6	6		
15.37	26	35.449	38.4696	28.01472	161	5.9	1.4	0.019	4.130	8.8	281.9	687.0	270.8	66	38.25	10	schist	7	15	18	5	5	6		
15.72	27	35.919	38.47046	28.018	154	4.9	1.4	0.017	3.430	9.0	312.7			49	36.15	10		7	8	9	5	4	6		
16.22	6	67.380	38.47113	28.02237	146	4.8	1.4	0.012	3.360	16.8	419.1			52	20	5	sediments	5	8	18	5	5	6	0.006	203.4
16.58	5	69.409	38.47344	28.02471	138	4.6	1.3	0.010	2.990	17.3	386.2			52	20	5	sediments	5	8	18	5	5	6	0.006	136.5
16.92	4	70.583	38.47574	28.02671	135	4.8	1.4	0.021	3.360	17.6	752.8	467.7	97.6	52	20	5	sediments	5	8	18	5	5	6	0.006	466.8
17.28	3	71.705	38.47802	28.02931	133	5.3	1.25	0.007	3.313	17.9	230.8			52	20	5	sediments	5	8	18	5	5	6	0.006	77.6
17.67	2	72.634	38.48108	28.03003	127	5.6	1.4	0.009	3.920	18.1	276.6			52	20	5	sediments	5	8	18	5	5	6	0.006	140.1
18.00	1	72.984	38.48283	28.03207	121	5.9	1.5	0.007	4.425	18.2	211.1			52	20	5	sediments	5	8	18	5	5	6	0.006	115.7
18.3#	28	73.200	38.48736	28.034028	114	5.9	1.5	0.003	4.425	18.3	105.8	206.1	36.1	52	20	5	sediments	5	8	18	5	5	6	0.006	37.3

[1] Discharge values scaled to a regional A (km^2) : Q (m^3/s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.

** Nearest site upstream of knickpoint*

 # Nearest site upstream of fault

TABLE S3 Bozdağ River

Downstream Distance, L (km)	Site	Drainage Area, A (km$^{2)}$	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	hardness (Selby points value)	Lithology	Weathering (Selby points value)	joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)	D50 estimate of grain size (m)	MPM transport capacity (kg/s)
1.04	12_01	0.98	38.32709	28.06918	1259	1	0.2	0.068	0.100	0.2	163.3														
1.38	12_02	1.52	38.33001	28.068537	1245	3.1	1.2	0.040	1.860	0.4	48.1														
1.66	12_03	1.56	38.3323	28.069234	1214	3.8	0.98	0.080	1.862	0.4	80.7			68	45.4	14	augen gniess	7	21	9	6	5	6		
2.08	12_04	2.48	38.33537	28.07119	1178	6.3	0.53	0.038	1.670	0.6	37.0			60	31.85	5	augen gniess	7	15	18	4	5	6		
2.95	12_05	3.79	38.34237	28.073845	1129	3.3	1.5	0.035	2.475	0.9	98.0	85.4	25.0	82	56.35	18	gniess	9	21	18	5	5	6		
3.56	12_06	7.27	38.34842	28.0751	1120	3.6	1.3	0.016	2.340	1.8	77.5														
3.64	12_07	10.64	38.35653	28.074889	1108	5.1	1.4	0.010	3.570	2.7	53.4														
4.92	12_08	10.63	38.36654	28.077189	1100	7.2	1	0.005	3.600	2.7	18.9														
6.16	12_09	24.98	38.37235	28.0786	1090	12	1.1	0.021	6.600	6.2	106.6	70.9	17.8												
7.57	12_11	30.28	38.38411	28.078698	1073	18.4	0.7	0.035	6.440	7.6	140.4			82	57.45	18	gneiss	9	21	18	5	5	6		
8.19	12_12	31.02	38.39047	28.078495	1057	4.6	1.1	0.114	2.530	7.7	1877.7			67	37.3	10	mica schist	9	15	18	4	5	6		
8.96	12_13	34.06	38.39316	28.079714	1037	9.2	0.9	0.056	4.140	8.5	505.8	841.3	416.6	68	36.45	10	mica schist	9	15	18	5	5	6		
9.33	12_27	34.36	38.39324	28.079397	1016	3.2	2.3	0.056	3.680	8.6	1467.1			67	47.75	14	gniess	7	21	9	5	5	6		
9.78	12_28	35.67	38.3959	28.07956	1000	5.6	0.9	0.049	2.520	8.9	761.3			68	41.7	14	schist	7	21	9	6	5	6		
9.94	12_10	27.68	38.38306	28.07946	1086	6.9	1.25	0.037	4.313	6.9	359.5														
10.09	12_29	35.87	38.3986	28.08098	996	5.8	1.4	0.045	4.060	8.9	686.3														
10.46*	12_30	36.53	38.39868	28.08095	969	4.8	1.9	0.080	4.560	9.1	1496.4			63	40.5	14	schist	7	8	18	5	5	6		
10.91	12_31	37.46	38.40588	28.08317	936	4.1	1.6	0.091	3.280	9.3	2032.1	1133.8	315.3	66	43.45	14	schist	9	8	18	6	5	6		
11.57	12_32	37.89	38.41056	28.08686	875	6.2	0.3	0.042	0.930	9.4	626.0														
12.56	12-33	39.6			686	18.7	0.6	0.044	5.610	9.9	226.0														
13.58	12_26	51.27	38.42581	28.095376	510	3.9	1.8	0.141	3.510	12.8	4515.3	1849.8	969.2	68	54.8	18	gniess	9	15	9	6	5	6		
14.19	12_25	52.12	38.43654	28.06258	403	3.6	1.4	0.153	2.520	13.0	5414.2			64	48.65	14	gniess	9	15	9	6	5	6		
14.76	12_24	57.16	38.43396	28.10014	361	3.5	1.5	0.072	2.625	14.3	2860.9			67	49.6	14	gniess	7	21	9	5	5	6		
15.13	12_23	57.51	38.43661	28.101457	3.43	3.5	1.8	0.052	3.150	14.3	2104.5			68	47.55	14	gniess	7	21	9	6	5	6		
15.41	12_22	27.68	38.48792	28.10431	330	4.3	1.8	0.087	3.870	6.9	1376.4			67	49.3	14	gniess	7	21	9	5	5	6		
15.96	12_20	57.98	38.44023	28.10835	297	7.5	1.2	0.144	4.500	14.5	2722.5	2895.7	762.7	57	32.95	5	gniess	7	21	9	4	5	6		
16.48	12_21	64.11	38.44362	28.111454	269	6.7	0.9	0.082	3.015	16.0	1922.6			63	46.9	14	gniess	9	15	9	5	5	6		
17.21	12_19	64.96	38.43963	28.106	226	5.8	1.5	0.017	4.350	16.2	477.8													0.015	449.6
18.01	12_18	67.68	38.4485	28.115341	204	10.5	0.5	0.023	2.625	16.9	357.5	919.3	435.5											0.015	205.4
18.51	12_17	68.35	38.4462	28.114458	180	29	1	0.009	14.500	17.0	50.3			70	48.05	14		7	15	18	5	5	6	0.015	356.9
19.07	12_16	69.35	38.45891	28.113863	166	8	3	0.007	12.000	17.3	147.9			53	20	5	sed	5	8	18	5	6	6	0.015	433.7
19.92	12_15	70.5	38.46269	28.111422	150	20	1.5	0.003	15.000	17.6	30.1			57	23.25	5	Breccia	7	8	18	7	6	6	0.015	91.8
20.44[#]	12_14	70.75	38.4691	28.10713	134	23.1	1.3	0.009	15.015	17.6	65.3	81.1	511.2	62	20	5	sed	5	15	18	7	6	6	0.015	451.7

[1] *Discharge values scaled to a regional A (km ^{2}) : Q (m ^{3} /s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.*

* *Nearest site upstream of knickpoint*

[#] *Nearest site upstream of fault*

S4 Kabazlı River

Downstream Distance, L (km)	Site	Drainage Area, A (km$^{2)}$)	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	hardness (Selby points value)	Lithology	Weathering (Selby points value)	joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)	D50 estimate of grain size (m)	MPM transport capacity (kg/s)
0.100	18 E	0.05	38.63603	28.18186	1462	1.08	0.3	0.031	0.162	0.0	3.6														
0.640	18 D	2.05	38.36861	28.18262	1453	2.8	0.4	0.023	0.560	0.5	40.6														
1.360	18 C	2.77	38.37478	28.18437	1415	3.2	0.5	0.021	0.800	0.7	44.3														
1.710	18 B	3.01	38.37732	28.18516	1395	1.8	0.4	0.014	0.360	0.8	57.1	36.4	11.5												
2.680	18 A	5.62	38.38492	28.19041	1297	6.2	1.2	0.058	3.720	1.4	127.7			75	53	18	gneiss	7	15	18	5	6	6		
3.210	18 F	7.52	38.38846	28.19439	1211	6.5	0.7	0.073	2.275	1.9	207.6			68	55.8	18	gneiss	7	8	18	5	6	6		
4.07*	18 G	7.84	38.39585	28.19728	1124	6.2	1.2	0.065	3.720	2.0	199.8	178.4	22.0	68	55.55	18	gneiss	9	15	9	6	5	6		
4.230	18_32	9.84	38.40687	28.20074	1027	3.9	1.2	0.073	2.340	2.5	452.9			70	52	18	gneiss	9	8	18	6	5	6		
4.630	18_31	10.29	38.40415	28.20177	636	3.6	1.2	0.065	2.160	2.6	451.6			73	52.1	18	gneiss	9	15	14	6	5	6		
4.900	18_30	10.37	38.40643	28.20214	886	4.6	1.4	0.105	3.220	2.6	578.8			72	50.25	18	gneiss	7	15	14	6	6	6		
5.140	18_29	10.44	38.40833	28.32023	826	3.2	1.7	0.086	2.720	2.6	683.2			83	54.3	18	gneiss	9	21	18	6	5	6		
5.460	18_28	12.69	38.4109	28.20142	755	3.2	1.8	0.056	2.880	3.2	542.0	541.7	48.4	72	53.8	18	gneiss	9	15	14	5	5	6		
5.750	18_27	12.40	38.41322	27.2031	701	2.8	2.2	0.047	3.080	3.1	510.6			73	61.25	20	gneiss	9	8	18	6	6	6		
6.094	18_25	14.46	38.41594	28.20386	631	3.5	1.2	0.098	2.100	3.6	990.0			75	55	14	gneiss	9	21	14	6	5	6		
6.160	18_23	14.49	38.41662	28.20448	618	4.5	5	0.070	11.250	3.6	550.4			62	49.65	14	gneiss	9	4	18	6	5	6		
6.261	18_22	14.52	38.41769	28.20458	596	9.8	1.7	0.123	8.330	3.6	444.7			68	61.75	20	gneiss	9	4	18	6	5	6		
6.622	18_02	15.48	38.41994	28.20583	568	7.3	1.4	0.054	5.110	3.9	280.7			55	41.3	14	schist	7	4	14	5	5	6		
6.734	18_01	16.03	38.42056	28.20608	567	9.4	1.6	0.107	7.520	4.0	445.4			65	56.25	18	schist	9	8	14	5	5	6		
7.119	18_03	16.27	38.42238	28.20799	515	9.8	1	0.398	4.900	4.1	1614.1	690.8	231.2	59	45.75	14	schist	7	8	14	5	5	6		
7.650	18_04	17.02	38.4265	28.20893	194	7.5	1.1	0.149	4.125	4.2	828.8						schist								
8.275	18_05	19.16	38.43129	28.20726	372	3	1.9	0.175	2.850	4.8	2723.5			65	41.6	14	schist	9	8	18	5	5	6		
8.429	18_26	19.21	38.43269	28.320715	333	3	2.2	0.037	3.300	4.8	573.7	1435.0	587.3	44	20	5	sediments	5	8	9	6	5	6		
8.499	18_06	19.29	38.43319	28.207	325	4.5	1.3	0.075	2.925	4.8	787.7						schist								
9.234	18_07	21.87	38.43885	28.20476	277	6.9	0.8	0.023	2.760	5.5	175.8			43	25	5	sediments	5	8	9	5	5	6		
9.625	18_08	22.44	38.44165	28.20223	253	3.2	1	0.038	1.600	5.6	658.4			43	29.85	5	sediments	5	8	9	5	5	6		
10.119	18_09	23.39	38.44473	28.19973	239	2.7	1	0.026	1.350	5.8	554.5	544.1	131.7	43	25	5	l conglomer	5	8	9	4	6	6		
10.645	18_21	24.57	38.46345	28.2001	211	3	0.4	0.014	0.600	6.1	279.5						sediments							0.027	9.4
11.238	18_20	24.83	38.45247	28.19978	192	11.7	0.7	0.026	4.095	6.2	135.8						sediments							0.027	457.8
11.832	18_11	26.31	38.4568	28.19958	173	7.4	0.8	0.012	2.960	6.6	106.2	173.8	46.3	44	25	5	sediments	5	8	9	5	6	6	0.027	88.4
12.674#	18_10	26.46	38.44835	28.20668	152	9.6	0.7	0.014	3.360	6.6	94.1			47	20	5	l conglomer	5	8	14	4	5	6	0.027	114.7
14.088	18_12	27.22	38.4719	28.19958	177	18.9	0.5	0.010	4.725	6.8	36.9	79.0	18.5	49	19	5									

[1] Discharge values scaled to a regional A (km^2) : Q (m^3/s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.

** Nearest site upstream of knickpoint*

 # Nearest site upstream of fault

TABLE S5 Yeniköy River

Downstream Distance, L (km)	Site	Drainage Area, A ($km^{2)}$)	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	hardness (Selby points value)	Lithology	Weathering (Selby points value)	joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)	D50 estimate of grain size (m)	MPM transport capacity (kg/s)
0.10	12_14	0.005	38.34533	28.35037	892	1	0.2	0.207	0.100	0.0	2.5			76	52.8	18	gniess	9	15	18	5	5	6		
0.28	12_15	0.212	38.34769	28.35056	839	1.2	0.2	0.171	0.120	0.1	73.8			59	53.2	18	gneiss	7	8	9	6	5	6		
0.52	12_16	0.392	38.34949	28.35152	785	1.3	0.4	0.216	0.260	0.1	159.3			66	53.9	18	gneiss	7	15	9	6	5	6		
0.81	12_17	0.604	38.35248	28.35247	744	1.5	0.4	0.171	0.300	0.2	168.2			72	43	18	gneiss	7	21	9	6	5	6		
1.11	12_01	0.751	38.35463	28.35272	660	2	0.5	0.180	0.500	0.2	165.1	113.8	36.8	72	57.4	18	gneiss	7	21	9	6	5	6		
1.49	12_02	1.241	38.35658	28.35508	613	3.2	1.2	0.194	1.920	0.3	184.2			58	38.6	10	gneiss	7	15	9	6	5	6		
1.78	12_03	1.890	38.35934	28.35566	568	7	1.2	0.117	4.200	0.5	77.5			58	38.7	10	gneiss	7	15	9	6	5	6		
2.13*	12_04	2.067	38.3622	28.35614	479	3.7	0.6	0.086	1.110	0.5	117.0	126.3	27.0	77	58.3	18	granite	9	15	18	6	5	6		
2.59	12_05	2.760	38.36593	28.35789	431	2.1	0.7	0.096	0.735	0.7	309.3			56	49.5	14	gneiss	9	8	9	5	5	6		
3.34	12_06	4.108	38.37163	28.35999	374	1.2	0.7	0.119	0.420	1.0	997.6	653.4	243.4												
3.92	12_07	7.116	38.37571	28.36195	348	6.5	0.75	0.044	2.438	1.8	116.8			54	40.2	14	sed	5	8	9	6	6	6		
5.20	12_09	11.139	38.38651	28.36134	292	14	0.4	0.014	2.800	2.8	27.2			45	20	5	sed	5	8	9	6	6	6		
5.51	12_08	9.762	38.38117	28.36065	301	12.3	1	0.030	6.150	2.4	57.6	67.2	22.8	45	18.8	5	sed	5	8	9	6	6	6		
5.72	12_10	12.175	38.3904	28.36275	272	13.2	1	0.010	6.600	3.0	23.6			45	18.8	5	sed	5	8	9	6	6	6	0.05	108.2
6.33	12_11	13.540	38.39597	28.13641	254	14	1	0.010	7.000	3.4	24.8			48	20	5	sed	9	8	9	5	6	6	0.05	114.7
6.85	12_12	14.082	38.39953	28.36529	239	12.6	1	0.012	6.300	3.5	33.4			61	20	5	sed	7	15	18	5	5	6	0.05	155.9
7.84#	12_13	14.539	38.4064	28.36834	211	12.7	1	0.010	6.350	3.6	29.3	27.8	2.2	51	20	10	congl.	7	8	9	6	5	6	0.05	104.1

[1] Discharge values scaled to a regional A (km^2) : Q (m^3/s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.

** Nearest site upstream of knickpoint*

 # Nearest site upstream of fault

TABLE S6 Badınca River

Downstream Distance, L (km)	Site	Drainage Area, A (km$^{2)}$	Latitude (deicmal degrees)	Longitude (Decimal degrees)	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area (m^2)	Discharge, Q (m^3/s), scaled to the regional A:Q ratio[1]	Unit stream power, ω (W/m^2)	Reach averaged unit stream power, ω (W/m^2)	Error (±½σ)	Selby Rock Mass Strength	Schmidt hammer rebound hardness	Hardness (Selby points value)	Lithology	Weathering (Selby points value)	Joint spacing (Selby points value)	Joint orientation (Selby points value)	Joint Width (Selby points value)	Joint Continuity (Selby points value)	Outflow of groundwater (Selby points value)	D50 estimate of grain size (m)	MPM transport capacity (kg/s)
0.9	E30	0.400	38.25151	28.49497	1530	1.1	0.3	0.024	0.165	0.1	21.7														
1.6	E18	1.568	38.25706	28.50278	1386	1.2	0.4	0.021	0.240	0.4	66.9														
1.94	E19	1.894	38.25939	28.49816	1342	1.4	0.4	0.031	0.280	0.5	103.9	64.2	20.6	70	42.35	14	gneiss	7	15	18	5	5	6		
2.39	E20	2.105	38.26147	28.50134	1210	2.4	0.5	0.019	0.600	0.5	41.2			71	42.85	14	gneiss	7	15	18	6	5	6		
2.87	E21	2.492	38.26475	28.50421	1020	3	0.5	0.042	0.750	0.6	85.1			62	34.8	10	schist	9	8	18	5	6	6		
3.41*	E22	2.859	38.26938	28.50384	974	3.6	0.7	0.040	1.260	0.7	78.0			58	37	10	schist	9	8	14	5	6	6		
3.98	E17	4.523	38.27411	28.50278	866	3.8	0.8	0.080	1.520	1.1	234.0	109.6	42.6	44		5	gneiss	5	8	9	6	5	6		
4.51	E7	7.548	38.27825	28.50187	815	4.1	0.6	0.117	1.230	1.9	528.5			58	36.85	10	schist	5	8	18	6	5	6		
4.79	E8	7.946	38.2803	28.50044	806	4.1	0.8	0.044	1.640	2.0	206.8			80	54.6	18	quartzite	9	21	14	6	6	6		
5.22	E9	8.374	38.28378	28.49981	786	4.5	0.5	0.033	1.125	2.1	150.9			60	45	14	gneiss	7	8	14	6	5	6		
5.54	E10	8.624	38.28589	28.49782	732	6.7	0.7	0.047	2.345	2.2	148.3			65	48.1	14	gneiss	5	15	14	5	6	6		
5.96	E11	15.706	32.28856	28.4999	698	6.5	1	0.054	3.250	3.9	319.8	270.9	80.0	63	47	14	gneiss	7	8	18	5	5	6		
6.28	E12	15.919	38.29079	28.50159	664	3.2	1.9	0.091	3.040	4.0	1106.4			62	50.05	18	gneiss	7	8	14	4	5	6		
6.46	E13	15.996	38.29146	28.50315	651	4.9	0.4	0.054	0.980	4.0	432.1			57	39.1	10	travertine	5	8	18	5	5	6		
6.7	E14	16.874	38.29233	28.50522	634	3.2	0.6	0.042	0.960	4.2	540.1			67	36.8	10	travertine	7	15	18	5	6	6		
7.04	E15	17.237	38.29294	28.508149	620	3.6	0.7	0.054	1.260	4.3	633.7						travertine								
7.33	E16	17.832	28.29485	28.51004	605	4.2	0.6	0.080	1.260	4.4	834.8			75	45.95	14	gneiss	5	21	18	6	5	6		
7.88	E26	18.952	38.29812	28.51394	557	3.6	0.9	0.072	1.620	4.7	922.2	744.9	127.0	48	20	5	sediments	5	8	14	5	5	6		
8.21	E1	19.331	38.30016	28.51562	543	3.2	1	0.105	1.600	4.8	1551.7			59	37.3	10	mica schist	7	8	18	5	5	6		
8.56	E2	19.851	38.30281	28.51715	518	7.2	0.4	0.045	1.440	5.0	306.0			59	38	10	mica schist	7	8	18	5	5	6		
9.01	E3	20.890	38.30547	28.5197	485	3.7	1.3	0.075	2.405	5.2	1037.5			69	51.7	18	granite	9	8	18	5	5	6		
9.37	E4	21.189	38.30744	28.52184	458	5.3	0.8	0.068	2.120	5.3	666.1			75	50.6	18	granite	7	15	18	6	5	6		
9.72	E5	21.546	38.30991	28.52252	437	2.4	1.2	0.054	1.440	5.4	1188.2			72	53.55	18	gneiss	9	8	20	6	5	6		
9.99	E6	21.739	38.31089	28.52501	413	3.8	0.6	0.073	1.140	5.4	1026.7	962.7	215.3	65	44.15	14	schist	7	8	20	5	5	6		
10.33	E23	22.129	38.31318	28.52709	390	5	0.7	0.042	1.750	5.5	453.3			57	38	10	travertine	7	8	14	6	6	6		
10.7	E24	2.651	38.31481	28.353061	373	3.1	0.5	0.054	0.775	0.7	113.2			67	37.3	10	travertine	7	15	18	6	5	6		
11.51	E25	25.126	38.3172	28.528029	311	4.1	0.8	0.068	1.640	6.3	1021.0	529.2	229.3	61	35.6	10	travertine	5	15	14	6	5	6		
12.62	E28	26.382	38.32	28.54807	249	4.6	1.2	0.017	2.760	6.6	244.7			52	20	5	sediments	5	8	18	5	5	6	0.071	150.8
13.02	E29	26.506	38.31945	28.55141	237	8	1	0.014	4.000	6.6	113.1			52	20	5	sediments	5	8	18	5	5	6	0.071	92.3
14.03[#]	E27	28.782	38.32102	28.56135	193	6.9	0.7	0.021	2.415	7.2	213.5	190.4	34.4	52	25.2	5	sediments	5	8	18	5	5	6	0.071	91.9

[1] Discharge values scaled to a regional A (km^2) : Q (m^3/s) of 4.01 : 1, derived from applying Mannings equation to the six studied rivers, and using the assumption that discharge increases downstream proportionally to drainage area.

** Nearest site upstream of knickpoint*

[#] Nearest site upstream of fault

Supplementary Material: Discharge Calculations

Tables S7 to Table S12 show local estimates of flow velocity and bankful water discharge, Q_L, obtained from applying Manning's equation downstream for each of our study rivers, based on our hydraulic geometry measures. However, this method is known to produce variations in predicted point water discharge over short lengthscales, while we know in rivers discharges increase downstream in with drainage area. For our purposes, we require a consistent and monotonic relationship between downstream drainage area and discharge, as explained in section 3.3 of the main text (c.f. Whittaker et al., 2007; Zondervan et al., 2020). We therefore use our hydraulic geometry measures to calculate a ratio of A to Q_L for each site downstream, and to derive a median value of this relationship for each of the six rivers, as shown in the tables, below.

TABLE S7 - Akçapınar River

Site	Drainage Area, A (km$^{2)}$	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m^2)	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^3/s)	Ratio of A: Q_L
1	0.83	863	0.9	0.5	0.035	0.23	0.5	0.1	7.1
2	1.11	855	4.1	0.3	0.112	0.62	0.3	0.2	5.4
3	1.71	819	3.8	0.3	0.021	0.57	0.1	0.1	20.7
4	1.87	799	5.3	0.7	0.054	1.86	1.3	2.4	0.8
5	1.92	788	2.7	0.3	0.045	0.41	0.2	0.1	22.2
6	2.39	734	5.1	0.85	0.141	2.17	3.0	6.5	0.4
7	2.53	734	3.4	0.7	0.030	1.19	0.9	1.1	2.3
8	2.63	720	3.1	0.85	0.037	1.32	1.5	2.0	1.3
9	2.752	707	6.2	0.8	0.037	2.48	1.4	3.4	0.8
10	7.67	703	4.6	0.9	0.016	2.07	1.1	2.3	3.3
11	7.79	703	6.7	0.8	0.031	2.68	1.3	3.4	2.3
12	9.98	688	6.7	1.6	0.044	5.36	5.9	31.9	0.3
31	10.114	681	5.4	1.7	0.035	4.59	6.0	27.5	0.4
32	10.35	676	5.5	1.6	0.047	4.40	6.2	27.2	0.4
33	11.64	673	5.9	1.4	0.044	4.13	4.6	18.8	0.6
44	12.48	659	3.5	0.9	0.089	1.58	2.7	4.2	2.9

43	12.72	624	3.7	1.6	0.052	2.96	6.5	19.3	0.7
42	13.37	595	3.1	1.6	0.042	2.48	5.8	14.4	0.9
41	13.81	547	4.1	1.2	0.047	2.46	3.5	8.5	1.6
40	22.53	511	4.5	0.8	0.054	1.80	1.7	3.0	7.6
39	23.15	497	3.8	1.1	0.056	2.09	3.2	6.6	3.5
38	23.57	451	2.9	1.5	0.073	2.18	6.8	14.7	1.6
37	26.81	425	4.1	0.6	0.065	1.23	1.0	1.3	21.4
36	26.47	390	5.7	0.5	0.049	1.43	0.6	0.9	30.2
27	33.37	333	6.4	0.6	0.107	1.92	1.3	2.5	13.3
26	34.37	319	6.1	0.9	0.098	2.75	2.8	7.7	4.4
25	34.52	299	3.2	1.2	0.072	1.92	4.3	8.2	4.2
24	34.67	280	3.7	0.9	0.068	1.67	2.3	3.9	8.9
23	35.67	280	4.1	0.6	0.033	1.23	0.7	0.9	39.8
22	35.28	280	3.7	0.8	0.052	1.48	1.6	2.4	14.6
21	35.54	274	4.1	0.7	0.047	1.44	1.2	1.7	20.9
20	35.83	240	3.2	0.6	0.054	0.96	0.9	0.9	40.1
19	35.98	220	3.6	0.6	0.047	1.08	0.9	0.9	38.4
18	41.76	215	9	0.4	0.084	1.80	0.5	0.9	45.0
28	42.01	188	4.3	0.9	0.052	1.94	2.1	4.0	10.5
14	42.71	948	4.9	0.9	0.095	2.21	2.8	6.1	7.0
15	42.95	948	5.2	0.8	0.082	2.08	2.0	4.2	10.1
16	43.52	157	5.6	0.5	0.072	1.40	0.7	1.0	41.8
17	43.71	149	5.6	0.6	0.052	1.68	0.9	1.5	28.4
30	44.38	131	4.8	0.5	0.056	1.20	0.7	0.8	56.3
29	46.5	123	8	1	0.024	4.00	1.7	6.9	6.7
13	46.6	121	6	3	0.002	9.00	4.2	37.6	1.2
34	46.7	116	7.6	0.9	0.037	3.42	1.7	5.9	7.9
35	46.71	97	8.9	0.6	0.007	2.67	0.3	0.9	52.3
								MEDIAN	6.9

*assuming a constant roughness n of 0.03

TABLE S8 - Sartçay River

Site	Drainage Area, A (km^{2})	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m^{2})	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^{3}/s)	Ratio of A: Q_L
8	1.790	959	6	0.5	0.047	1.500	0.60	0.90	1.98
9	2.218	957	1.1	0.3	0.021	0.165	0.14	0.02	92.87
10	2.225	957	1.7	0.5	0.044	0.425	0.58	0.25	9.02
11	2.793	953	1.5	0.5	0.030	0.375	0.48	0.18	15.57
12	3.406	941	2.2	0.6	0.024	0.660	0.63	0.41	8.25
13	3.718	936	2.7	0.5	0.035	0.675	0.52	0.35	10.61
14	4.035	912	5.5	0.9	0.073	2.475	2.44	6.04	0.67
15	4.315	911	3.7	0.5	0.024	0.925	0.43	0.40	10.74
16	5.306	909	5.6	0.85	0.030	2.380	1.38	3.29	1.61
17	5.505	899	6.2	0.5	0.021	1.550	0.40	0.62	8.83
18	5.795	886	3.2	0.45	0.019	0.720	0.31	0.22	25.81
19	6.977	880	1.7	1.5	0.024	1.275	3.91	4.98	1.40
20	7.147	870	6	0.5	0.031	1.500	0.49	0.74	9.68
21	7.670	886	5.2	0.9	0.059	2.340	2.19	5.13	1.49
22	8.049	838	7.1	0.4	0.033	1.420	0.32	0.46	17.51
29	8.510	825	4.5	0.7	0.033	1.575	0.99	1.56	5.45
30	8.806	800	3.6	1	0.016	1.800	1.39	2.51	3.51
31	11.313	770	3.9	1.9	0.033	3.705	7.31	27.07	0.42
32	11.960	739	4.8	0.6	0.028	1.440	0.67	0.96	12.42
33	12.310	711	5.2	0.7	0.051	1.820	1.23	2.23	5.52
34	13.191	657	5	0.6	0.117	1.500	1.37	2.06	6.41
35	15.196	594	6.2	0.5	0.056	1.550	0.66	1.02	14.93
36	15.378	558	3.2	1.8	0.077	2.880	9.99	28.76	0.53

37	17.106	526	4.8	1.6	0.063	3.840	7.13	27.40	0.62
41	20.454	402	3.7	1.7	0.037	3.145	6.15	19.34	1.06
40	21.694	363	2.1	1.3	0.031	1.365	3.33	4.54	4.77
39	21.880	320	1.9	2.6	0.044	2.470	15.69	38.77	0.56
38	22.598	256	2.6	1.8	0.063	2.340	9.03	21.13	1.07
23	29.479	210	2.2	2.4	0.073	2.640	17.34	45.79	0.64
24	32.341	182	3.5	0.9	0.058	1.575	2.16	3.40	9.50
25	33.534	172	3.9	2.5	0.023	4.875	10.46	51.00	0.66
26	35.449	161	5.9	1.4	0.019	4.130	3.02	12.46	2.84
27	35.919	154	4.9	1.4	0.017	3.430	2.88	9.87	3.64
6	67.380	146	4.8	1.4	0.012	3.360	2.41	8.09	8.33
5	69.409	138	4.6	1.3	0.010	2.990	1.92	5.75	12.08
4	70.583	135	4.8	1.4	0.021	3.360	3.15	10.59	6.66
3	71.705	133	5.3	1.25	0.007	3.313	1.45	4.81	14.92
2	72.634	127	5.6	1.4	0.009	3.920	2.03	7.97	9.11
1	72.984	121	5.9	1.5	0.007	4.425	2.09	9.24	7.90
28	73.200	114	5.9	1.5	0.003	4.425	1.48	6.54	11.20
								MEDIAN	6.5

*assuming a constant roughness n of 0.03

TABLE S9 Bozdağ River

Site	Drainage Area, A (km$^{2)}$	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m^2)	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^3/s)	Ratio of A: Q_L
12_01	0.98	1259	1	0.2	0.068	0.100	0.12	0.01	84.45
12_02	1.52	1245	3.1	1.2	0.040	1.860	3.21	5.96	0.25
12_03	1.56	1214	3.8	0.98	0.080	1.862	3.03	5.64	0.28

12_04	2.48	1178	6.3	0.53	0.038	1.670	0.61	1.02	2.43
12_05	3.79	1129	3.3	1.5	0.035	2.475	4.67	11.56	0.33
12_06	7.27	1120	3.6	1.3	0.016	2.340	2.35	5.51	1.32
12_07	10.64	1108	5.1	1.4	0.010	3.570	2.23	7.96	1.34
12_08	10.63	1100	7.2	1	0.005	3.600	0.80	2.89	3.67
12_09	24.98	1090	12	1.1	0.021	6.600	1.95	12.84	1.95
12_11	30.28	1073	18.4	0.7	0.035	6.440	1.02	6.55	4.62
12_12	31.02	1057	4.6	1.1	0.114	2.530	4.54	11.48	2.70
12_13	34.06	1037	9.2	0.9	0.056	4.140	2.13	8.81	3.87
12_27	34.36	1016	3.2	2.3	0.056	3.680	13.90	51.14	0.67
12_28	35.67	1000	5.6	0.9	0.049	2.520	1.99	5.02	7.11
12_10	27.68	1086	6.9	1.25	0.037	4.313	3.32	14.34	1.93
12_29	35.87	996	5.8	1.4	0.045	4.060	4.64	18.84	1.90
12_30	36.53	969	4.8	1.9	0.080	4.560	11.38	51.88	0.70
12_31	37.46	936	4.1	1.6	0.091	3.280	8.58	28.15	1.33
12_32	37.89	875	6.2	0.3	0.042	0.930	0.20	0.19	199.01
12-33	39.6	686	18.7	0.6	0.044	5.610	0.84	4.69	8.45
12_26	51.27	510	3.9	1.8	0.141	3.510	13.50	47.37	1.08
12_25	52.12	403	3.6	1.4	0.153	2.520	8.52	21.47	2.43
12_24	57.16	361	3.5	1.5	0.072	2.625	6.69	17.57	3.25
12_23	57.51	3.43	3.5	1.8	0.052	3.150	8.24	25.96	2.22
12_22	27.68	330	4.3	1.8	0.087	3.870	10.65	41.21	0.67
12_20	57.98	297	7.5	1.2	0.144	4.500	6.07	27.33	2.12
12_21	64.11	269	6.7	0.9	0.082	3.015	2.58	7.78	8.24
12_19	64.96	226	5.8	1.5	0.017	4.350	3.30	14.37	4.52
12_18	67.68	204	10.5	0.5	0.023	2.625	0.42	1.10	61.61
12_17	68.35	180	29	1	0.009	14.500	1.04	15.05	4.54
12_16	69.35	166	8	3	0.007	12.000	8.36	100.27	0.69
12_15	70.5	150	20	1.5	0.003	15.000	1.48	22.16	3.18
12_14	70.75	134	23.1	1.3	0.009	15.015	1.75	26.34	2.69
								MEDIAN	2.4

*assuming a constant roughness n of 0.03

TABLE S10
Kabazlı River

Site	Drainage Area, A (km²⁾	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m²)	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^3/s)	Ratio of A: Q_L
18 E	0.05	1462	1.08	0.3	0.031	0.162	0.18	0.03	1.74
18 D	2.05	1453	2.8	0.4	0.023	0.560	0.27	0.15	13.67
18 C	2.77	1415	3.2	0.5	0.021	0.800	0.40	0.32	8.61
18 B	3.01	1395	1.8	0.4	0.014	0.360	0.21	0.08	39.80
18 A	5.62	1297	6.2	1.2	0.058	3.720	3.84	14.29	0.39
18 F	7.52	1211	6.5	0.7	0.073	2.275	1.48	3.36	2.24
18 G	7.84	1124	6.2	1.2	0.065	3.720	4.07	15.14	0.52
18_32	9.84	1027	3.9	1.2	0.073	2.340	4.34	10.15	0.97
18_31	10.29	636	3.6	1.2	0.065	2.160	4.07	8.79	1.17
18_30	10.37	886	4.6	1.4	0.105	3.220	7.06	22.73	0.46
18_29	10.44	826	3.2	1.7	0.086	2.720	9.40	25.57	0.41
18_28	12.69	755	3.2	1.8	0.056	2.880	8.51	24.52	0.52
18_27	12.40	701	2.8	2.2	0.047	3.080	11.68	35.97	0.34
18_25	14.46	631	3.5	1.2	0.098	2.100	5.01	10.52	1.37
18_23	14.49	618	4.5	5	0.070	11.250	73.45	826.36	0.02
18_22	14.52	596	9.8	1.7	0.123	8.330	11.25	93.73	0.15
18_02	15.48	568	7.3	1.4	0.054	5.110	5.07	25.90	0.60
18_01	16.03	567	9.4	1.6	0.107	7.520	9.30	69.93	0.23
18_03	16.27	515	9.8	1	0.398	4.900	7.01	34.35	0.47
18_04	17.02	194	7.5	1.1	0.149	4.125	5.20	21.44	0.79
18_05	19.16	372	3	1.9	0.175	2.850	16.76	47.76	0.40
18_26	19.21	333	3	2.2	0.037	3.300	10.30	33.98	0.57

18_06	19.29	325	4.5	1.3	0.075	2.925	5.15	15.06	1.28
18_07	21.87	277	6.9	0.8	0.023	2.760	1.07	2.96	7.40
18_08	22.44	253	3.2	1	0.038	1.600	2.18	3.48	6.44
18_09	23.39	239	2.7	1	0.026	1.350	1.80	2.43	9.64
18_21	24.57	211	3	0.4	0.014	0.600	0.21	0.13	194.91
18_20	24.83	192	11.7	0.7	0.026	4.095	0.88	3.61	6.88
18_11	26.31	173	7.4	0.8	0.012	2.960	0.79	2.33	11.31
18_10	26.46	152	9.6	0.7	0.014	3.360	0.64	2.16	12.24
18_12	27.22	177	18.9	0.5	0.010	4.725	0.28	1.34	20.27
								MEDIAN	1.2

*assuming a constant roughness n of 0.03

TABLE S11 Yeniköy River

Site	Drainage Area, A (km$^{2)}$	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m^2)	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^3/s)	Ratio of A: Q_L
12_14	0.005	892	1	0.2	0.207	0.100	0.20	0.02	0.25
12_15	0.212	839	1.2	0.2	0.171	0.120	0.18	0.02	9.61
12_16	0.392	785	1.3	0.4	0.216	0.260	0.83	0.21	1.82
12_17	0.604	744	1.5	0.4	0.171	0.300	0.74	0.22	2.74
12_01	0.751	660	2	0.5	0.180	0.500	1.18	0.59	1.27
12_02	1.241	613	3.2	1.2	0.194	1.920	7.05	13.54	0.09
12_03	1.890	568	7	1.2	0.117	4.200	5.48	23.03	0.08
12_04	2.067	479	3.7	0.6	0.086	1.110	1.17	1.30	1.59
12_05	2.760	431	2.1	0.7	0.096	0.735	1.69	1.24	2.22
12_06	4.108	374	1.2	0.7	0.119	0.420	1.88	0.79	5.20

12_07	7.116	348	6.5	0.75	0.044	2.438	1.31	3.18	2.24
12_09	11.139	292	14	0.4	0.014	2.800	0.21	0.59	18.94
12_08	9.762	301	12.3	1	0.030	6.150	1.91	11.77	0.83
12_10	12.175	272	13.2	1	0.010	6.600	1.14	7.50	1.62
12_11	13.540	254	14	1	0.010	7.000	1.14	7.96	1.70
12_12	14.082	239	12.6	1	0.012	6.300	1.23	7.74	1.82
12_13	14.539	211	12.7	1	0.010	6.350	1.14	7.22	2.01
								MEDIAN	1.8

*assuming a constant rougness n of 0.03

TABLE S12 Badınca River

Site	Drainage Area, A (km$^{2)}$	Elevation (m)	Bankfull Width, W (m)	Bankfull Depth, H (m)	Channel slope (y/x)	Channel cross-sectional area, C (m^2)	Manning's Equation velocity (m/s)*	Local Discharge estimate, Q_L (m^3/s)	Ratio of A: Q_L
E30	0.400	1530	1.1	0.3	0.024	0.165	0.16	0.03	15.51
E18	1.568	1386	1.2	0.4	0.021	0.240	0.26	0.06	25.39
E19	1.894	1342	1.4	0.4	0.031	0.280	0.32	0.09	21.46
E20	2.105	1210	2.4	0.5	0.019	0.600	0.38	0.23	9.11
E21	2.492	1020	3	0.5	0.042	0.750	0.57	0.43	5.84
E22	2.859	974	3.6	0.7	0.040	1.260	1.09	1.37	2.08
E17	4.523	866	3.8	0.8	0.080	1.520	2.02	3.07	1.48
E7	7.548	815	4.1	0.6	0.117	1.230	1.37	1.69	4.48
E8	7.946	806	4.1	0.8	0.044	1.640	1.49	2.44	3.26
E9	8.374	786	4.5	0.5	0.033	1.125	0.51	0.57	14.71
E10	8.624	732	6.7	0.7	0.047	2.345	1.18	2.77	3.11
E11	15.706	698	6.5	1	0.054	3.250	2.59	8.40	1.87
E12	15.919	664	3.2	1.9	0.091	3.040	12.10	36.79	0.43

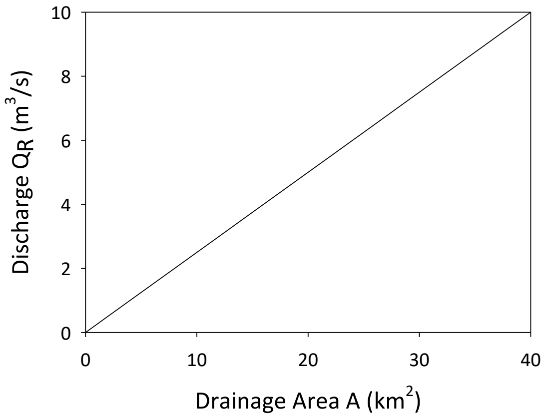
E13	15.996	651	4.9	0.4	0.054	0.980	0.41	0.41	39.45
E14	16.874	634	3.2	0.6	0.042	0.960	0.82	0.79	21.46
E15	17.237	620	3.6	0.7	0.054	1.260	1.27	1.60	10.80
E16	17.832	605	4.2	0.6	0.080	1.260	1.13	1.43	12.47
E26	18.952	557	3.6	0.9	0.072	1.620	2.41	3.90	4.86
E1	19.331	543	3.2	1	0.105	1.600	3.60	5.76	3.35
E2	19.851	518	7.2	0.4	0.045	1.440	0.38	0.55	36.39
E3	20.890	485	3.7	1.3	0.075	2.405	5.15	12.38	1.69
E4	21.189	458	5.3	0.8	0.068	2.120	1.86	3.94	5.38
E5	21.546	437	2.4	1.2	0.054	1.440	3.72	5.36	4.02
E6	21.739	413	3.8	0.6	0.073	1.140	1.08	1.24	17.59
E23	22.129	390	5	0.7	0.042	1.750	1.11	1.95	11.34
E24	2.651	373	3.1	0.5	0.054	0.775	0.65	0.50	5.29
E25	25.126	311	4.1	0.8	0.068	1.640	1.86	3.05	8.25
E28	26.382	249	4.6	1.2	0.017	2.760	2.11	5.83	4.52
E29	26.506	237	8	1	0.014	4.000	1.31	5.25	5.05
E27	28.782	193	6.9	0.7	0.021	2.415	0.79	1.90	15.12
*assuming a constant roughness n of 0.03								**MEDIAN**	5.6

Table S13, below, shows the a comparison of the median **$A{:}Q_L$** scaling for each of the six rivers, taken from Tables S7 to S12. Mean rainfall in the region is ca. 500 mm/yr and is not documented to vary significantly at the scale of our field sites, so we do not anticipate that the regional scaling between drainage area and discharge ought to differ between the rivers over longer timescales. Therefore to calculate a consistent, monotonic relationship between drainage area and water discharge for all our study sites, we determine water discharges downstream using the mean value of $A{:}Q_L$ for the six rivers (Table S13). This approach ensures that (i) variations in stream power and bedrock erodibility within catchments are not predicated solely on point estimates of discharge and that (ii) variations in stream power and bedrock erodibility between catchments are not determined by differing choices of discharge-drainage area scaling. We do not have grain size measurements for more than 95% of the measuring sites so to avoid unconstrained complexity we have assumed a constant Manning's roughness coefficient of 0.03 in all of these calculations (c.f. Knighton, 1998)[1]. Estimates of discharge would scale linearly if this value were changed – a doubling of *n* leads to a halving of Q_L at each site, and a doubling of $A{:}Q_L$ scaling ratio.

TABLE S13 A:Q_L scaling between catchments

River	**A** (km^2) : **Q_L** (m^3/s) median scaling ratio
Akipinar	6.8
Sart	6.5
Bozdag	2.5
Kabazli	1.2
Yanikoy	1.8
Badica	5.6
MEAN	**4**

Figure S1: Discharge against drainage area for the regional scaling relationship used in the paper



We use a value of ~4 for A:Q_L in the units given in Table S13, and this value is propagated for our discharge estimates for the six study rivers in Tables S1 to S6. If regional discharge, Q_R is expressed in the form Q = zA, in SI units, the scaling variable has units of [L/T] and a value of z = 0.25 x 10^{-6} m/s. This regional scaling relationship means that a catchment with a drainage area of 40 km^2 would have a bankful discharge of 10 m^3/s (Fig. S1, above) and fits squarely within published size relationships of water discharge variation with catchment area (Burgers et al., 2014)[2]. We use this scaling relationship in all subsequent calculations in this paper. Not accounting for infiltration, and given a mean rainfall rate of 0.5 m/yr, using this scaling, our catchments would equal the anticipated yearly total discharge if they operated for ca. 25 days a year at this discharge level. If a different c value were used in these calculations, bedrock erodibilities and stream powers presented in the main text of the paper would scale with the square root of the ratio of the change.

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[1] Knighton, D, 1998, *Fluvial Forms and Processes*, Hodder Arnold, 383 pp. ISBN 9780340663134

[2] Burgers, H. E., Schipper, A. M., Hendrick, A. J., 2014, *Size relationships of water discharge in rivers: scaling of discharge with catchment area, main-stem length and precipitation*, Hydrological Processes, 28, 5769-5775.

Supplementary Material: Stream power in the sedimentary units.

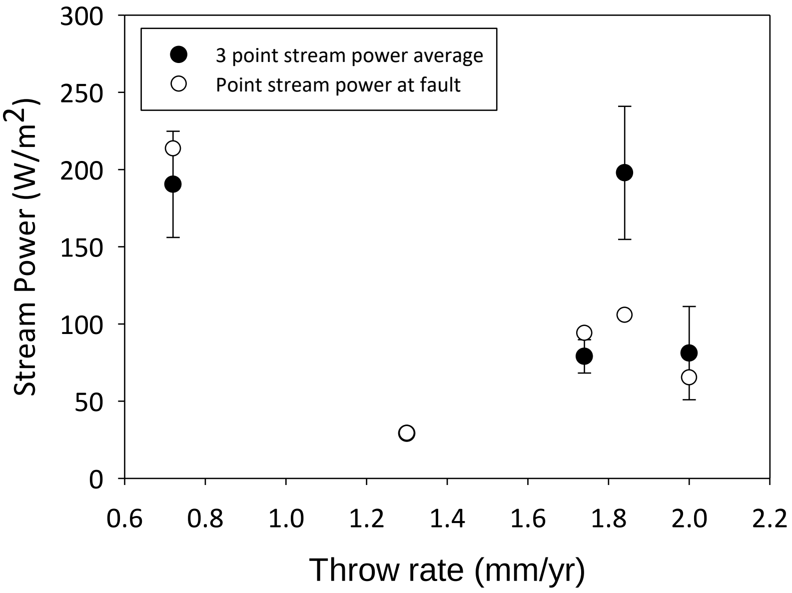
In the main text we explored how stream power in the sedimentary units scaled with fault throw rate in the 2km upstream of the range bounding faults, and concluded that while stream power in these reaches was demonstrably lower than that developed in the metamorphic units, it did not scale predictably with fault throw rate, as a simple version of the stream power model might suggest. To double check this important conclusion, we also here plot point measurements of stream power at our field sites closest to the faults on each river, and also the mean of the stream powers for the 3 points closest to the fault (Table S14 and Fig. SY), derived from the data presented in Tables S1 to S6

TABLE S14 Additional stream power estimates in the sedimentary units near the fault

	Throw rate (mm/yr)	Point stream power at fault (W/m^2)	3 point average stream power at fault (W/m^2)	3 point 0.5σ error (W/m^2)
Sart	1.84	105.8	197.8	43.1
Bozdag	2	65.3	81.1	30.2
Kabazli	1.74	94.1	79	10.8
Badica	0.72	213.6	190.4	34.4
Yanikoy	1.3	29.3	29.1	2.3

Both sets of data produce similar outcomes (Fig. S2) and support the conclusions made in the main text that unit stream powers in the sedimentary rocks exposed close the fault do not scale with fault throw rate, no matter whether point measures or reach averaged values are used.

Figure S2: Stream power against fault throw rate in the sedimentary rocks



Supplemental methods – Selby Rock Mass Strength index

The Selby Rock Mass Strength (SRMS) index was developed by Selby (1980) for rock slope assessments and has been subsequently used for a wide range of geomorphological applications. It is a semi-quantitative measure of rock strength that combines a series of eight variables measured in the field. Variables are: *in situ* strength of the intact rock as recorded by Schmidt hammer rebound tests; measurements of joint spacing, joint width, presence or absence of joint infill, lateral or vertical continuity of joints and orientation with respect to the hillslope, where joints are any geological discontinuity such as bedding, foliation, joints or faults, and other features that can effect the rock strength such as evidence of ground water flow and the state of the weathering of the rock. After each variable is assessed or measured, a number is assigned to that variable using the look-up table reproduced below, and all values are summed to give the overall SRMS value from 0 to 100; where 0-26 is very weak, 27 – 50 is weak, 51-70 is moderate, 71-90 is strong and 91 - 100 is very strong.

Table S15. Classification of the Selby Rock Mass Strength, modified from Selby (1980).

Variable	**Weighting %**	**Very Strong**	**Strong**	**Moderate**	**Weak**	**Very Weak**
Intact rock strength	20	100-60 *r = 20*	60-50 *r = 18*	50-40 *r = 14*	40-35 *r = 10*	35-10 *r = 5*
Weathering	10	Unweathered r = 10	Slightly weathered r = 9	Moderately weathered r = 7	Highly weathered r = 5	Completely weathered r = 3
Joint spacing	30	> 3 m r = 30	3 – 1 m r = 28	1 – 0.3 m r = 21	300 - 50 mm r = 15	< 50 mm r = 8
Joint Orientation	20	Very favourable, steep dips into slope, cross joints interlock r = 20	Favourable, moderate dips into slope r = 18	Fair. Horizontal dips or nearly vertical dips r = 14	Unfavourable. Moderate dips out of slope r = 9	Very unfavourable. Steep dips out of slope r = 5
Joint width	7	< 0.1 mm r = 7	0.1-1 mm r = 6	1-5 mm r = 5	5 - 20 mm r = 4	> 20 mm r = 2
Joint continuity and infill	7	None, continuous r = 7	Few, continuous r = 6	Continuous, no infill r = 5	Continuous, thin infill r = 4	Continuous, thick infill r = 1
Ground-water outflow	6	None r = 6	Trace r = 5	Slight <40 mls^{-1}m^{-2} r = 6	Moderate 40-200 mls^{-1}m^{-2} r = 6	Great >200 mls^{-1}m^{-2} r = 1
Total		**100-91**	**90-71**	**70-51**	**50-26**	**26-0**

Supplemental methods – Grain size analysis

We do not have gain size data for ca. 95% of the field sites. However, for a few sites, grain size estimates were obtained from scaled field photographs of gravel bars (Figure S3) from rivers with sedimentary rocks exposed upstream of the active normal fault. As only five photographs were available to be analysed to give an indication of the grainsize of the sediment bedload, the analysis was undertaken manually following standard Wolman point count methods (i.e., Bunte and Abt, 2001)*.

Grainsize measurements were undertaken in Adobe Photoshop. Using the analysis tool 'set measurement scale' the length of the scale indicator was set, allowing the length of the intermediate axis of pebbles to be determined using the ruler tool. A grid was placed over the photograph and the clasts found at each grid intersection where measured, where large clasts covered multiple intersections the clasts were recorded multiple times, and intersections obscured by leaves etc., were skipped Where the point falls on very fine grainsize a point was measured. For four photographs this resulted in between 192 – 278 pebble counts on photographs taken vertically down onto the bar. Unfortunately, a photograph taken perpendicular to the bar surface was not available for the Sartçay. A photograph for this purpose had not been taken as undertaking grain-size measurements was not originally part of the research project. However, we did have a photograph of a high-flow bar from an angle but only 92 clasts could be counted and owing to the photograph orientation the error on this grainsize estimate will be greater than for the other rivers and likely explains why the estimated grainsize is lower along this river than in the others.

Once the pebbles had been measured the data was saved and exported into Excel. Grainsize in mm was converted to phi using the calculation phi = Log (grainsize in mm) / -log(2) and cumulative frequency curves plotted by sorting the data from largest to smallest clast and dividing the clast size by the total number of clasts measured. D_{50} and D_{84} values can be read from either the Excel table or from the cumulative frequency curve (Figure S4).

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*Bunte, K. and Abt, S.R., 2001. Sampling surface and subsurface particle-size distributions in wadable gravel-and cobble-bed streams for analyses in sediment transport, hydraulics, and streambed monitoring. *Gen. Tech. Rep. RMRS-GTR-74. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station. 428 p.*, *74*.

Selby, M. J., 1980. A rock mass strength classification for geomorphic purposes: with tests from Antarctica and New Zealand. Zeitschrift für Geomorphologie, v. 24(1), p. 31-51.

Bozdağ

Kabazlı

Yeniköy

Badınca

Sart

Figure S3 Photographs used to estimate grainsize for rivers in the study area. Pencils are 15 cm long and the Estwing hammer is 28.6 cm long.

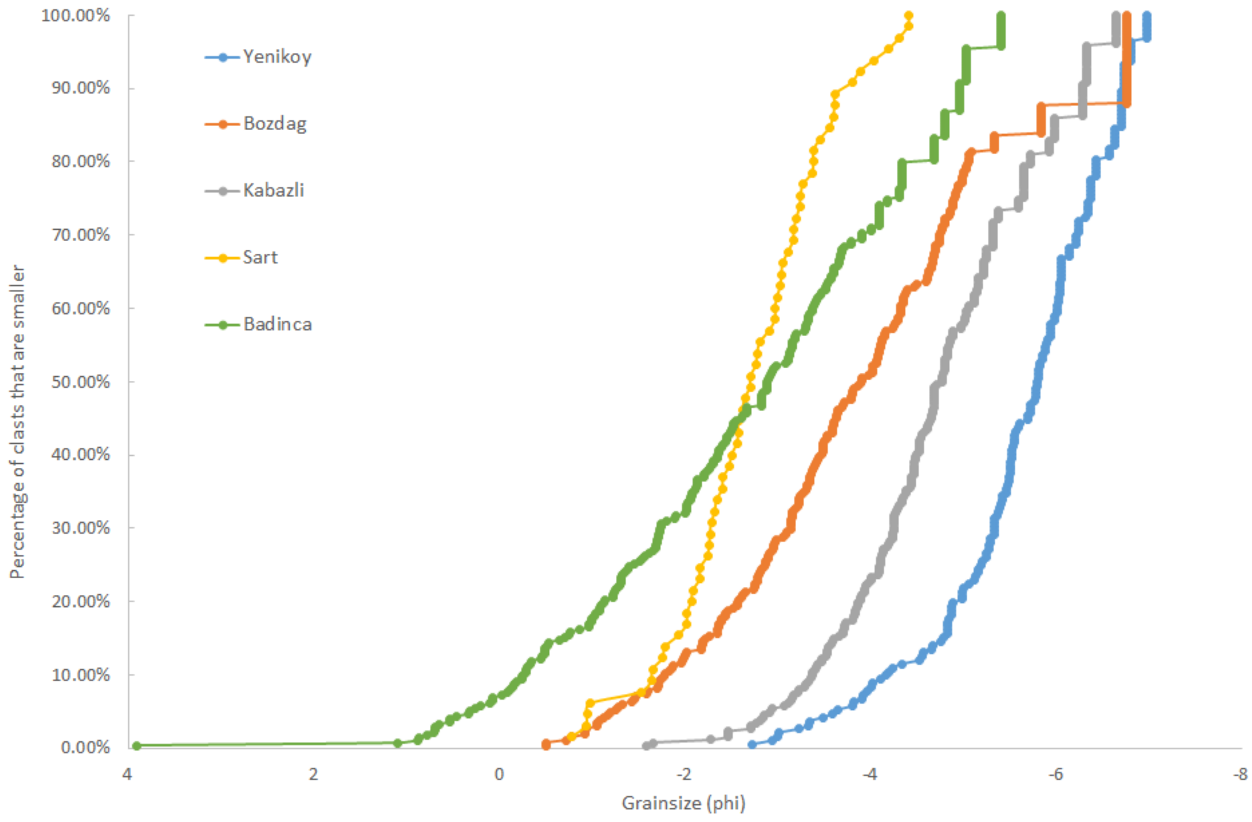

Figure S4. Cumulative frequency curves of grainsize for studied rivers.