

**Table DR1: Station locations, upstream area and years of data available.**

Station number	Longitude	Latitude	Upstream area [km <sup>2</sup> ]	Years of data available
87	101.50	23.35	3610	17
84	97.97	24.70	4022	6
85	98.27	24.68	4243	17
96	99.40	25.00	3641	2
55	96.20	32.30	16959	20
57	98.82	28.82	77090	4
35	99.63	27.17	199	18
4	99.38	25.83	88177	26
75	100.20	25.62	2519	2
43	100.10	25.60	2693	6
86	100.02	25.35	9209	12
5	100.47	24.60	108522	23
11	100.42	21.95	1056	23
32	99.42	23.38	1746	5
49	100.70	23.50	1891	20
70	100.70	22.88	1381	2
89	103.30	22.65	231	10
97	99.37	24.08	3235	17
110	99.37	25.90	182	1
6	101.07	21.88	138301	22
100	98.83	24.63	3684	18

99	98.43	24.00	7905	6
105	103.27	23.00	285	6
108	103.45	23.03	318	7
93	99.23	23.68	690	1
261	100.10	23.95	3924	20
94	99.57	22.27	746	16
98	98.25	24.43	280	2
109	104.05	22.65	907	18
15	99.15	25.10	114158	23
90	104.28	23.45	2704	27
91	104.77	22.95	5299	14
88	101.90	22.97	1610	9
95	98.80	24.43	441	1
102	102.27	24.67	537	10
104	102.02	24.48	610	6
101	100.57	25.10	2611	23
103	102.15	23.63	21660	21
106	103.55	22.85	32983	25
311	91.78	29.88	5980	10
306	89.60	28.90	108957	11
301	89.72	29.33	14	5
302	91.88	29.28	165838	10
305	94.57	29.47	203904	12

**Table DR2: Calculated mean daily flow, mean daily monsoon flow,  $Q_{eff}$ , annual flood, fraction of sediment transported during monsoon, and fraction of discharge transported during monsoon for each station.**

Station number	Mean daily flow [m <sup>3</sup> /s]	Mean monsoon flow [m <sup>3</sup> /s]	$Q_{eff}$ [m <sup>3</sup> /s]	Annual flood [m <sup>3</sup> /s]	Fraction of discharge transported during monsoon	Fraction of sediment transported during monsoon
87	81	159	210	349	0.66	0.84
84	197	377	449	697	0.64	0.87
85	175	323	423	739	0.61	0.82
96	19	38	46	108	0.68	0.87
55	138	282	383	342	0.68	0.93
57	771	1586	1817	2480	0.68	0.96
35	3	4	11	8	0.48	0.75
4	938	1770	2138	2490	0.63	0.89
75	28	39	14	65	0.46	0.75
43	27	34	98	33	0.40	0.72
86	128	211	358	346	0.54	0.81
5	1212	2196	3059	3020	0.60	0.86
11	18	32	42	43	0.59	0.68
32	45	86	111	77	0.64	0.89
49	56	107	144	304	0.63	0.83
70	23	50	99	152	0.71	0.90
89	7	14	20	34	0.66	0.81
97	22	38	99	12	0.58	0.82
110	19	34	185	211	0.58	0.98
6	1796	3248	3296	4970	0.60	0.82
100	157	307	371	618	0.65	0.83

99	226	425	589	1	0.62	0.78
105	21	36	74	56	0.59	0.90
108	3	6	11	18	0.64	0.89
93	14	24	68	75	0.56	0.80
261	89	151	176	17	0.57	0.79
94	18	37	45	22	0.68	0.91
98	13	24	135	79	0.63	0.89
109	88	174	165	285	0.65	0.91
15	1669	3337	3801	4320	0.67	0.92
90	26	44	53	97	0.54	0.85
91	95	180	154	241	0.63	0.87
88	44	90	735	206	0.68	0.89
95	23	41	53	103	0.60	0.94
102	4	7	9	15	0.58	0.89
104	2	4	5	14	0.55	0.87
101	16	31	53	62	0.64	0.81
103	161	292	455	544	0.60	0.84
106	286	502	609	751	0.58	0.80
311	22	45	65	47	0.69	0.96
306	461	950	1806	1430	0.68	0.96
301	256	575	771	891	0.75	0.94
302	863	1835	3281	2570	0.70	0.96
305	1801	3825	3927	4610	0.71	0.83

### **Details of $Q_{\text{eff}}$ and monsoon characteristic calculations.**

For each station, we start with daily mean suspended sediment concentration ( $S_{\text{CD}}$ ;  $\text{kg}/\text{m}^3$ ) and daily mean discharge ( $Q_{\text{D}}$ ;  $\text{m}^3/\text{s}$ ).

1. Calculate daily suspended sediment load ( $S_{\text{LD}}$ ;  $\text{kg}/\text{day}$ ).  $S_{\text{LD}} = S_{\text{CD}} * Q_{\text{D}} * 60 * 60 * 24$
2. Create bins for the histogram, each of which is  $1/25$  of the range of  $Q_{\text{D}}$
3. For each bin, find all the  $S_{\text{LD}}$  values which have  $Q_{\text{D}}$  in the correct range. Add them together to determine the total sediment load transported by discharges in that range ( $S_{\text{L}}$ )
4. Find the bin with the highest  $S_{\text{L}}$ . This is the effective discharge ( $Q_{\text{eff}}$ ).
5. If the bin is the first bin (i.e., has the lowest discharges), add another bin and repeat steps 2-4 until  $Q_{\text{eff}}$  is not in the first bin. If two bins have the same  $S_{\text{L}}$ , reduce the total number of bins by one and repeat steps 2-4 until  $Q_{\text{eff}}$  is a unique value.

Figure DR1. Histograms showing effective discharge calculations for 5 stations of increasing basin area: 55, 57, 4, 5, 6. All are along the main stem of the Mekong River.

