GSA DATA REPOSITORY item 2004104

In this data repository we expand our discussion of our methods for identifying and projecting channel segments. We extracted channel profiles for 97 tributaries to the Red River with drainage area >40 km^2 from 90 m DEM data (Figs. DR1 and DR2, see Fielding et al., 1994 for dataset details). Channels segments were identified, and a concavity (χ) and normalized steepness (k_s) determined for each using methods developed by Snyder et al. (2000), Kirby and Whipple (2000) and Kirby et al. (2003). Concavity was determined by a linear best fit to slope-area data on a log-log plot over the drainage area corresponding to the channel segment. Because steepness index is highly correlated to concavity, a normalized steepness was determined over the same drainage area, but with a fixed concavity of 0.45. The actual value we use matters little, but this value is within the range of commonly reported concavities (Tucker and Whipple, 2002).

Channel segment categorization

Channel segments within each profile were then categorized as upper, middle or lower segments (Fig. DR2 and Table DR1). We used a number of criteria in this identification, including position along the channel, channel concavity and normalized steepness, and relationship to our field and DEM-based observations of the various landscape components.

Upper segments are consistently low in concavity (most in the range 0.2 to 0.6) and low in slope (most in the range 20 to 60), and of course always occur in the uppermost part of the tributary profile. Some channel segments which fit these criteria, however, were rejected because they corresponded to a region where, based on DEM analysis or field observation, the relict landscape has been removed. In such cases, these channel segments were categorized instead as middle segments.

Middle channel segments usually have a concavity less than 1 (for 89% of channel segments) and a normalized steepness index less than 150 (for 82% of channel segments). An upper channel segment may be present upstream of the middle segment and a lower channel segment is always present downstream. In many cases, we identified two middle channel segments which have slightly different channel parameters and are separated by an internal knickpoint. These internal knickpoints may reflect a wide range of factors, including, most importantly, lithology and data noise, but given the regional coherence of the three-segment pattern and the relative consistency of channel parameters across these internal knickpoint, we do not think this causes difficulty for our overall analysis. In these cases, parameters for both segments are retained in Table DR1 and for determination of mean parameters.

Lower channel segments must exist in every tributary profile. Concavity in these segments is usually greater than 1 (for 87% of channel segments) and normalized steepness is greater than 150 (for 94% of channel segments). We also observed a number of examples in which segments we categorize as lower channel segments are separated by an internal knickpoint. Again, we do believe this causes difficulty for our analysis.

In a number of channels (15), which we refer to as "fully equilibrated" channels, we observed no discernible knickpoints.

Channel segment projection

We were able to fit and project upper and middle channel segments for 28 and 30 profiles respectively (Table DR2 and Fig. DR3). Using mean concavity values of 0.38 for the upper segments and 0.64 for the lower segments, we obtained a linear best fit to the slope-drainage area data over a specified drainage area range corresponding to the channel segments (same as for determining steepness index with a fixed concavity, described above). Uncertainty was determined based on the standard deviation of slope and area data and propagated through the steepness index calculation. Using this steepness index, the input concavity and the drainage area data downstream of the channel segment, we projected the channel profile to its confluence with the Red River. We repeated this for the maximum and minimum steepness index values based on the steepness index uncertainty. Total incision, incision recorded by the upper channel segments (stage 1), incision recorded by the middle channel segments (stage 2) and the ratio of stage 2 to stage 1 incision are calculated (Table DR2). All possible upper and middle channel segments were projected. Reasons for not projecting channels include: (1) insufficient data for a meaningful regression; (2) too much scatter in the data for a meaningful regression; (3) drainage area is too large, different processes may be operating on these channels compared to shorter tributaries, and therefore comparison is innappropriate; or (4) there are multiple channel segments.

REFERENCES

Fielding, E., Isacks, B., Barazangi, M., Duncan, C., 1994, How flat is Tibet?: Geology, v. 22, p. 163-167.

Kirby, E., and Whipple, K.X., 2001, Quantifying differential rock-uplift rates via stream profile analysis: Geology, v. 29, p. 415-418.

Kirby, E., Whipple, K.X., Tang W.,. and Chen Z., 2003, Distribution of active rock uplift along the eastern margin of the Tibetan Plateau: Inferences from bedrock channel longitudinal profiles, Journal of Geophysical Research, v. 108, doi:10.1029/2001JB000861.

Snyder, N.P., Whipple, K.X., Tucker, G.E., and Merritts, D.J., 2000, Landscape response to tectonic forcing: DEM analysis of stream profiles in the Mendocino triple junction region, northern California: Geological Society of America Bulletin, v. 112, p. 1250-1263.

Tucker, G.E., and Whipple, K.X., 2002, Topographic outcomes predicted by stream erosion models: Sensitivity analysis and intermodel comparison: Journal of Geophysical Research, v. 107, doi:10.1029/2001JB000162.

FIGURE CAPTIONS

Figure DR1. Red River drainage network derived from 90 m DEM (see Fielding et al. (1994) for dataset details). Trunk channel shown with a heavy weight line, analyzed tributaries with a medium weight line and additional, non-analyzed tributaries with a fine weight line.

Figure DR2. Longitudinal profiles for 97 tributaries to the Red River in China, tributary locations shown in Figure DR1. Channel segment categorization is indicated by a colored box, with blue for upper channel segments, green for middle channel segments and red for lower channel segments. Fully equilibrated channels are indicated with a purple box. Numbers within each box indicate the concavity and the normalized steepness index (separated by a slash) for each channel segment. This data is tabulated in Table DR1. Channel segment boxes without steepness index or concavity values correspond to cases in which the channel segment was too short and therefore contained too few data points for a meaningful regression, or cases in which there was too much scatter in the data for a meaningful regression. Tributaries are labeled if they are fully equilibrated, if they are of the two-segment morphology, or if a channel segment is projected. If an appropriate channel segment is not projected, the reason is given in the label. See text for further explanation. Tributaries are arranged roughly according to upstream distance with Ailao Shan tributaries on the left hand side of the figure and Yangtze Plateau tributaries on the right hand side. Position of the Red River fault marked on Ailao Shan tributaries. Bend in the Red River fault occurs approximately between tributaries 54 and 55.

Figure DR3. Projected channel segments for 44 tributaries to the Red River. Longitudinal profile data shown in plots on left hand side with projected channel segments for upper and/or middle channel segments indicated with a solid line, and uncertainty indicated with dashed line. Elevations of projected intersections with the Red River are tabulated in Table DR2. Slope-area data for longitudinal profiles shown in plots on right hand side with fit used to determine steepness index indicated with solid lines and uncertainty indicated with dashed lines. Concavity and steepness values differ between Table DR1/Figure DR2 and Figure DR3 because concavity for DR2 is determined by a best fit to the data and steepness is determined with a fixed concavity of 0.45, while for figure DR3, concavity is a fixed value of 0.38 for upper segments and 0.64 for middle segments, and steepness values are determined using these fixed concavities.

TABLE DR1. NORMALIZED STEEPNESS AND CONCAVITY VALUES, ALL CHANNEL SEGMENTS

Tributary Number	Upper Concavity†	Upper Steepness‡	Middle Concavity	Middle Steepness	Lower Concavity	Lower Steepness	Channel location and type§
1 (u,m)	0.63	31	0.73	197	14.00	419	Yunnan Plateau
					4.20	273	
2 (m)			0.52	126	1.10	279	Ailao Shan
					9.10	162	
3 (m)			0.42	106	2.00	256	Ailao Shan
					10.00	164	
4 (m)			0.44	158	0.57	294	Ailao Shan
					2.50	302	
5 (u)	0.49	20	0.24	86	1.40	164	Yunnan Plateau
					2.80	201	
6 (u)	0.38	66			2.30	453	Ailao Shan
7			0.38	95	3.00	302	Yunnan Plateau
8 (m)			0.40	125			Ailao Shan
9 (u)	0.21	29	0.63	203			Yunnan Plateau
10 (m)			0.50	139	1.20	213	Ailao Shan
					1.70	301	
					1.40	293	
11			0.62	72	7.20	656	Yunnan Plateau
			0.88	160			
12 (m)			0.45	131	0.57	246	Ailao Shan
13					0.52	145	YP equilibrated
14			1.30	137	1.90	389	Yunnan Plateau
					1.60	201	
15 (u,m)	0.30	36	0.84	140	6.40	288	Ailao Shan
					2.10	293	
16			0.23	26	4.50	145	Yunnan Plateau
			0.73	93	7.90	313	
17 (m)			0.40	139			Ailao Shan
18			1.50	90	4.50	143	Yunnan Plateau
					3.20	515	
19			0.50	45	11.00	534	Yunnan Plateau
			1.00	164			
20			0.23	129	4.50	341	Ailao Shan
21 (u,m)	0.45	24			4.30	453	Yunnan Plateau
22					0.32	161	AS equilibrated
23			0.72	74	6.30	687	Yunnan Plateau
			1.40	141			
26			0.90	103	0.42	243	Ailao Shan
27 (u,m)	0.22	56	0.29	163	0.84	246	AS equilibrated
					2.20	241	
28			0.55	19	8.30	514	Yunnan Plateau
			0.74	97			
29 (u,m)	0.43	31	1.20	80	3.30	106	Yunnan Plateau
					3.80	465	
30			0.26	67	1.50	318	AS equilibrated
			0.63	172	3.00	373	
31			0.37	61	2.60	252	Yunnan Plateau
			0.18	161			
32					0.73	213	AS equilibrated

33			0.20	46	0.18	183	Yunnan Plateau
			1.00	175			
34			0.34	124	5.70	186	Ailao Shan
			0.40	275			
35 (m)			0.39	118	1.50	205	Yunnan Plateau
36			0.40	106	2.10	179	Ailao Shan
			1.00	147			
37 (u,m)	0.17	41	1.00	99	2.20	309	Yunnan Plateau
					10.00	297	
38			0.72	63	3.50	414	Yunnan Plateau
			1.30	71			
39 (m)			0.32	51	0.93	312	Ailao Shan
40			1.20	80	2.70	479	Yunnan Plateau
			0.40	90			
41 (u,m)	0.43	23	1.00	107	3.00	438	Ailao Shan
42 (m)			1.50	141	8.90	667	Yunnan Plateau
43			0.44	59	2.30	325	Ailao Shan
			1.20	187			
44			0.53	85	0.37	102	Yunnan Plateau
45			0.47	52	4.30	375	Ailao Shan
			0.41	132			
46 (u)	0.27	18	0.39	107	2.70	334	Ailao Shan
47			0.32	59			Yunnan Plateau
			0.62	86			
48 (m)			0.70	64	4.00	277	Ailao Shan
49					1.70	160	Ailao Shan
50					0.45	149	NE equilibrated
51			0.18	98	1.80	123	Ailao Shan
			0.36	244			
52					0.63	190	NE equilibrated
53					0.57	102	AS equilibrated
54			0.53	50	23.00	305	AS
			0.23	144			
55 (m)			0.35	94	2.00	234	AS
56					0.51	163	YP equilibrated
57					0.48	142	YP equilibrated
58 (u)	0.07	21			1.40	473	AS two segment
59					0.40	95	YP equilibrated
60 (u)	0.50	15	0.92	247	6.40	417	Ailao Shan
61 (m)			0.74	66	3.30	271	Ailao Shan
					3.20	326	
62					0.52	111	YP equilibrated
63					0.59	146	YP equilibrated
64 (u,m)	0.56	26	1.10	125	4.30	496	Ailao Shan

65 (u,m)	0.91	45	0.80	70	5.20	608	Ailao Shan
66 (u,m)	0.30	32	0.30	93	0.97	169	Yunnan Plateau
67					0.67	243	AS equilibrated
68 (m)			0.70	90	1.80	159	Yunnan Plateau
69 (u)	0.30	46	0.52	101	4.20	457	Ailao Shan
70 (m)			0.50	86			Yunnan Plateau
71			0.46	68	5.50	593	Ailao Shan
			0.25	135			
72			0.39	56	3.00	482	Ailao Shan
			1.50	249			
73			0.69	71	5.60	362	Yunnan Plateau
			0.19	130			
74 (u)	0.55	64	0.69	262	4.20	357	Ailao Shan
75			0.59	36			Yunnan Plateau
76 (u,m)	0.28	29	0.46	67	2.20	214	Yunnan Plateau
					5.60	253	
77			0.51	41			Yunnan Plateau
78 (u)	0.37	38			1.70	459	AS two segment
79 (u)	0.23	54	0.90	180	1.20	203	Yunnan Plateau
					6.60	190	
80 (u,m)	0.27	31	0.64	103	1.00	160	Yunnan Plateau
					1.30	212	
81 (m)			0.60	117	1.20	179	Yunnan Plateau
82 (u)	0.38	40					Ailao Shan
83 (u,m)	0.19	7	0.44	73	1.10	411	Ailao Shan
84 (u,m)	0.47	24	0.86	60	1.60	300	Ailao Shan
					5.40	682	
85			0.44	83	2.10	266	Yunnan Plateau
			0.82	131			
86			0.28	44	6.60	535	Ailao Shan
			1.30	95			
			0.86	175			
87 (u)	0.80	57	0.72	85	2.60	409	Yunnan Plateau
			0.40	131			
88 (u)	0.31	24			0.73	281	AS two segment
92					0.26	144	YP equilibrated
93			0.10	66	0.15	205	Yunnan Plateau
94					0.31	208	Ailao Shan
95			0.97	66			Yunnan Plateau
96					0.72	105	YP equilibrated
100			0.30	160	0.84	186	Ailao Shan
101 (u)	0.29	63	0.62	141	1.40	150	Yunnan Plateau
					1.40	167	

106	0.36	25	2.00	156	Ailao Shan
108	0.62	43	1.50	265	Ailao Shan
109	0.67	90			Ailao Shan
	2.20	103			
112			0.35	71	AS equilibrated

Note: See Figure DR1 for channel locations and Figure DR2 for tributary morphology. Tributaries for which upper segments are projected are marked with a u, and for which middle segments are projected are marked with an m. Projection data given in DR Table 2 and Figure DR3.

[†]Concavity determined by linear regression to selected slope-area data using a 20 m contour interval.

[‡]Normalized steepness index determined by linear regression to slope-area data but with a fixed concavity of 0.45.

[§] Channels to the southwest of the Red River are designated as "Ailao Shan" and channels to the northeast are "Yunnan Plateau." Fully equilibrated channels (no internal knickpoints or segmentation) from the southwest are labeled "AS equilibrated" and from the northeast are "YP equilibrated." Channels with a two segment morphology (upper and lower channels only) all four within the Ailao Shan, are labeled "AS two segment."

TABLE DR2. PROJECTED CHANNEL SEGMENT VALUES AND RIVER INCISION

Trib. number	River elev (m)	Upper proj. elev (m) †	Middle proj. elev (m) ‡	Total incision (m)	1st stage incision (m)	2nd stage incision (m)	Incision ratio 2nd:1st stage	Channel location
1	91	1234 ± 732	631 ± 446	1143 ± 732	603 ± 857	540 ± 446	0.90 ± 0.74	Yunnan Plateau
5	110	1407 ± 299		1297 ± 299				Yunnan Plateau
6	108	1485 ± 201		1377 ± 201				Ailao Shan
9	172	1499 ± 228		1327 ± 228				Yunnan Plateau
15	146	1662 ± 240	780 ± 421	1516 ± 240	882 ± 485	634 ± 421	0.72 ± 0.48	Ailao Shan
21	183	1652 ± 239	1004 ± 211	1469 ± 239	648 ± 319	821 ± 211	1.27 ± 0.33	Yunnan Plateau
27	189	1490 ± 348	1154 ± 322	1301 ± 348	336 ± 474	965 ± 322	2.87 ± 0.96	Ailao Shan
29	207	1592 ± 343	1142 ± 213	1385 ± 343	450 ± 404	935 ± 213	2.08 ± 0.47	Yunnan Plateau
37	232	1453 ± 398	1126 ± 263	1221 ± 398	327 ± 477	894 ± 263	2.73 ± 0.80	Yunnan Plateau
41	301	1751 ± 472	1061 ± 384	1450 ± 472	690 ± 608	760 ± 384	1.10 ± 0.56	Ailao Shan
46	340	1721 ± 340		1381 ± 340				Ailao Shan
58	426	1876 ± 65		1450 ± 65				Ailao Shan
60	432	2012 ± 133		1580 ± 133				Ailao Shan
64	426	1924 ± 143	1335 ± 246	1498 ± 143	589 ± 285	909 ± 246	1.54 ± 0.42	Ailao Shan
65	441	1770 ± 322	1730 ± 141	1329 ± 322	40 ± 352	1289 ± 141	32.23 ± 3.55	Ailao Shan
66	435	1412 ± 355	1148 ± 270	977 ± 355	264 ± 446	713 ± 270	2.70 ± 1.02	Yunnan Plateau
69	541	1845 ± 261		1304 ± 261				Ailao Shan
74	541	1675 ± 679		1134 ± 679				Ailao Shan
76	605	1394 ± 408	1237 ± 130	789 ± 408	157 ± 428	632 ± 130	4.03 ± 0.83	Yunnan Plateau
78	619	2189 ± 267		1570 ± 267				Ailao Shan
79	653	1459 ± 139		806 ± 139				Yunnan Plateau
80	710	1517 ± 244	1190 ± 288	807 ± 244	327 ± 377	480 ± 288	1.47 ± 0.88	Yunnan Plateau
82	752	2136 ± 348		1384 ± 348				Ailao Shan
83	792	2352 ± 64	1968 ± 79	1560 ± 64	384 ± 102	1176 ± 79	3.06 ± 0.21	Ailao Shan
84	806	2187 ± 195	2053 ± 162	1381 ± 195	134 ± 254	1247 ± 162	9.31 ± 1.21	Ailao Shan
87	855	1496 ± 468		641 ± 468				Yunnan Plateau
88	860	2401 ± 216		1541 ± 216				Ailao Shan
101	1046	1629 ± 225		583 ± 225				Yunnan Plateau

Note: Errors are 1 sigma, calculated for projections as described in data repository text and propagated through incision and incision ratio determinations. See Figure DR1 for channel locations and Figure DR3 for channel morphology.

†Elevation at projected upper channel segment at intersection with Red River.

‡Elevation of projected middle channel segment at intersection with Red River.

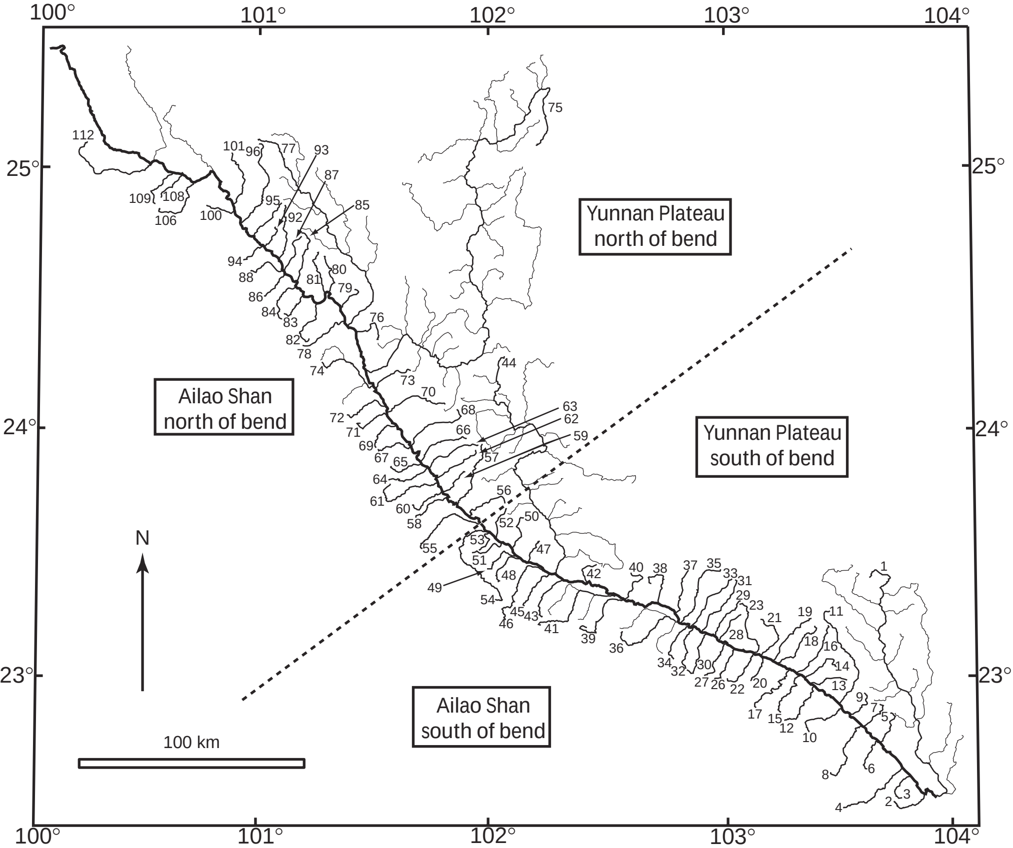

100°
101°
102°
103°
104°
25°
24°
23°
Yunnan Plateau north of bend
Yunnan Plateau south of bend
Ailao Shan north of bend
Ailao Shan south of bend
N
100 km

Figure DR1

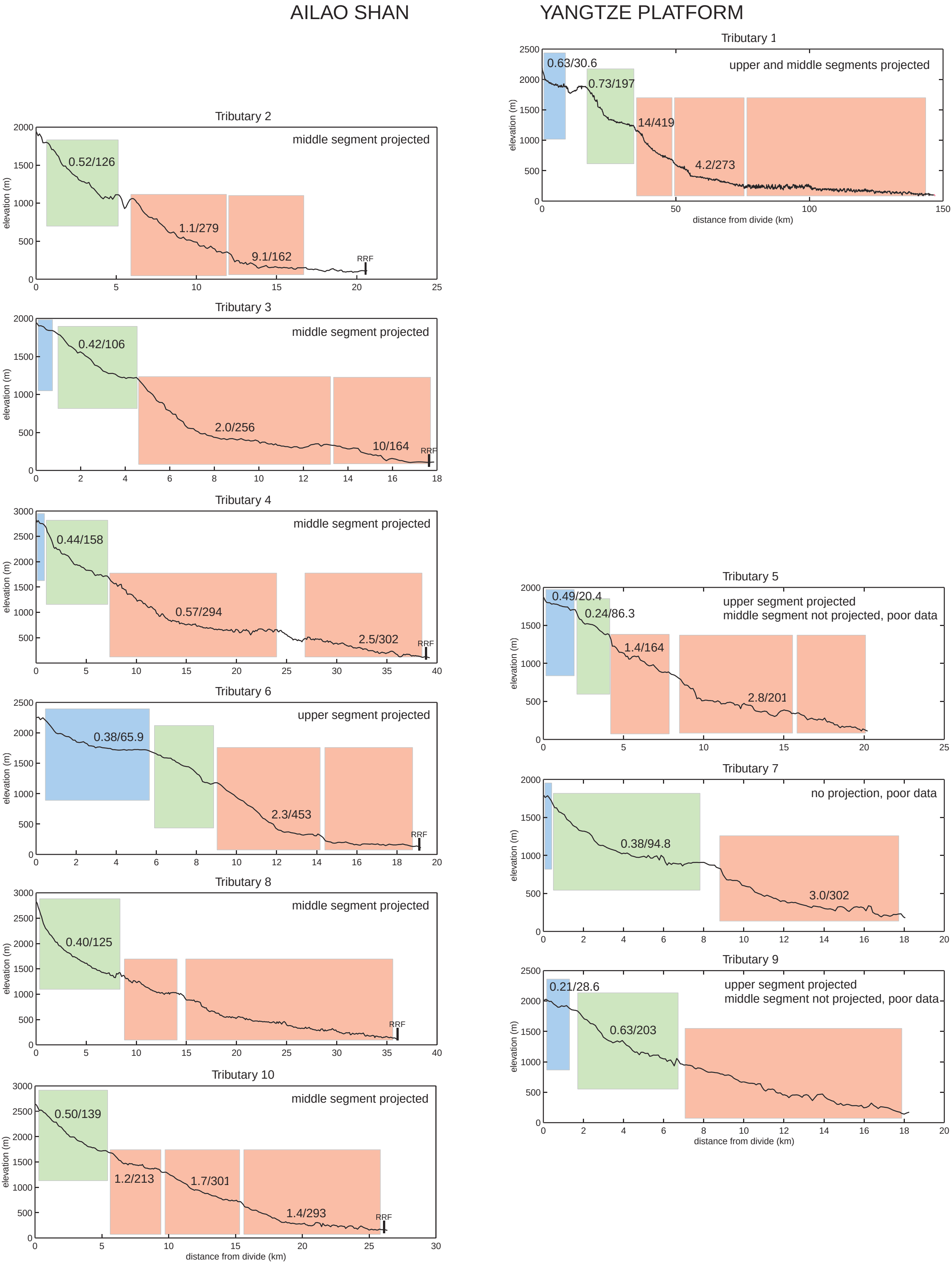

AILAO SHAN
YANGTZE PLATFORM
Tributary 1
upper and middle segments projected
0.63/30.6
0.73/197
14/419
4.2/273
distance from divide (km)
elevation (m)
Tributary 2
middle segment projected
0.52/126
1.1/279
9.1/162
RRF
Tributary 3
middle segment projected
0.42/106
2.0/256
10/164
RRF
Tributary 4
middle segment projected
0.44/158
0.57/294
2.5/302
RRF
Tributary 5
upper segment projected
middle segment not projected, poor data
0.49/20.4
0.24/86.3
1.4/164
2.8/201
Tributary 6
upper segment projected
0.38/65.9
2.3/453
RRF
Tributary 7
no projection, poor data
0.38/94.8
3.0/302
Tributary 8
middle segment projected
0.40/125
RRF
Tributary 9
upper segment projected
middle segment not projected, poor data
0.21/28.6
0.63/203
Tributary 10
middle segment projected
0.50/139
1.2/213
1.7/301
1.4/293
RRF
distance from divide (km)

Figure DR2.1

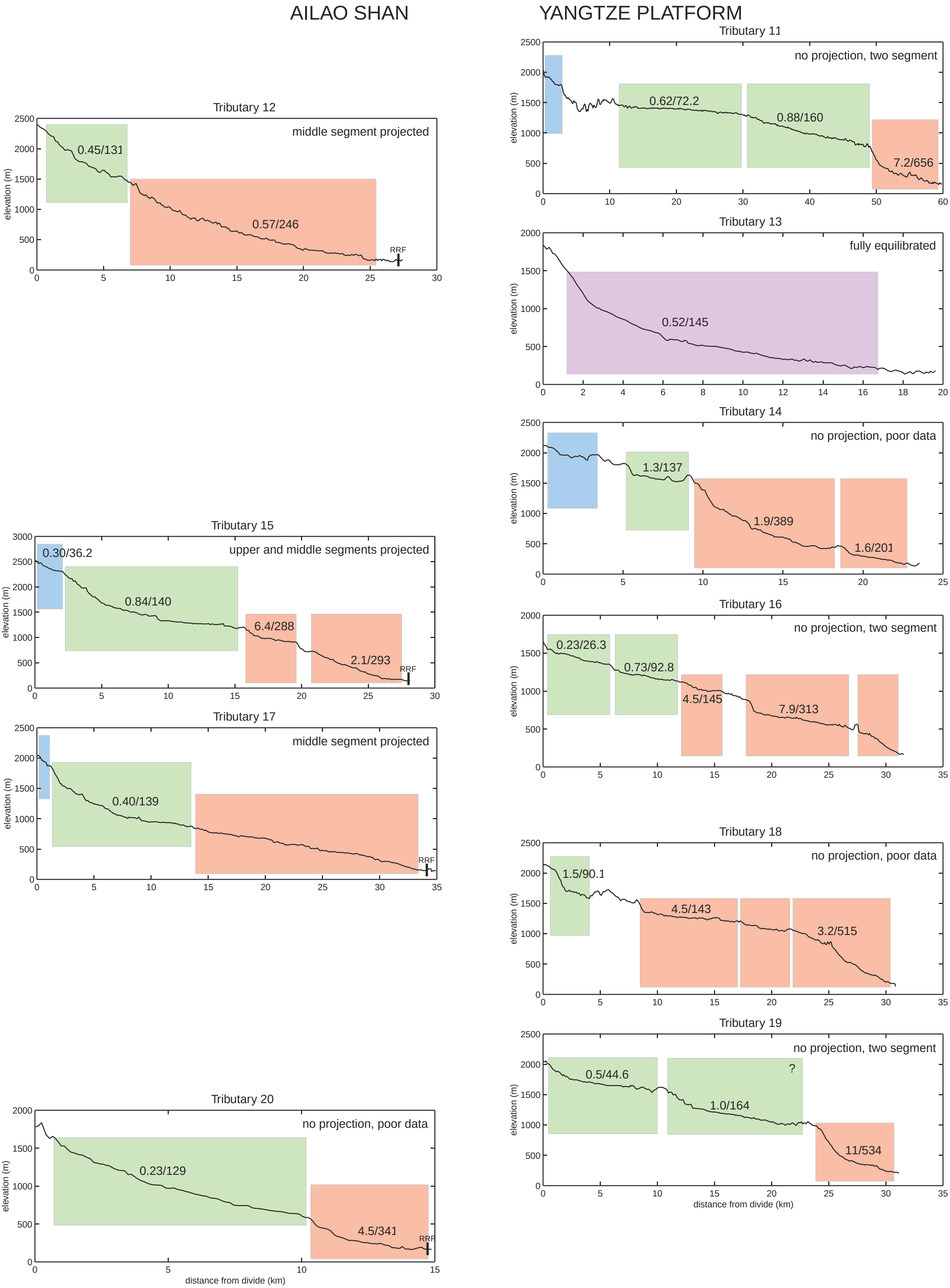

AILAO SHAN
YANGTZE PLATFORM
Tributary 12
middle segment projected
0.45/131
0.57/246
RRF
Tributary 15
upper and middle segments projected
0.30/36.2
0.84/140
6.4/288
2.1/293
RRF
Tributary 17
middle segment projected
0.40/139
RRF
Tributary 20
no projection, poor data
0.23/129
4.5/341
RRF
Tributary 11
no projection, two segment
0.62/72.2
0.88/160
7.2/656
Tributary 13
fully equilibrated
0.52/145
Tributary 14
no projection, poor data
1.3/137
1.9/389
1.6/201
Tributary 16
no projection, two segment
0.23/26.3
0.73/92.8
4.5/145
7.9/313
Tributary 18
no projection, poor data
1.5/90.1
4.5/143
3.2/515
Tributary 19
no projection, two segment
0.5/44.6
?
1.0/164
11/534
elevation (m)
distance from divide (km)

FIGURE DR2.2

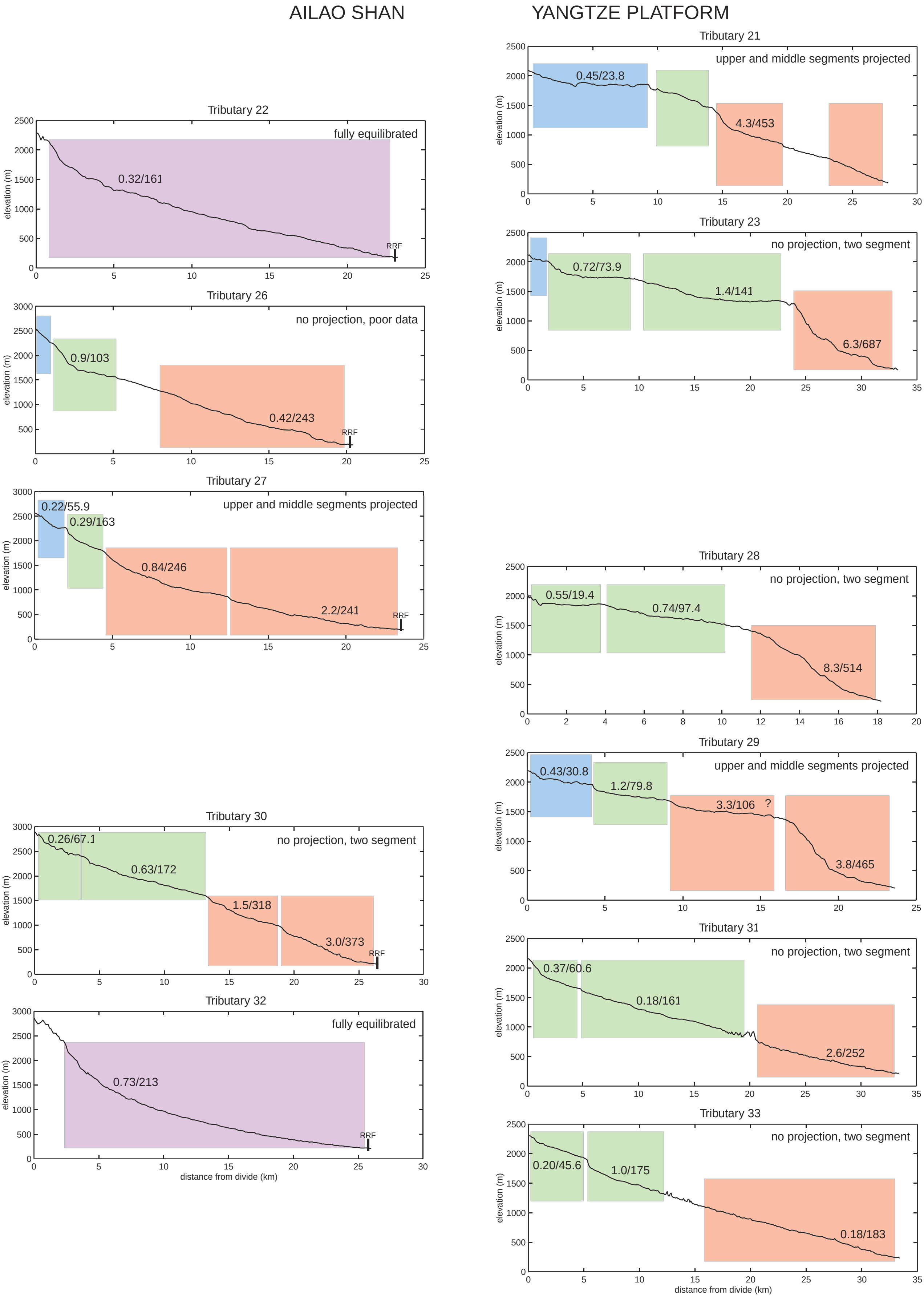

AILAO SHAN
YANGTZE PLATFORM
Tributary 22
fully equilibrated
0.32/161
RRF
Tributary 26
no projection, poor data
0.9/103
0.42/243
RRF
Tributary 27
upper and middle segments projected
0.22/55.9
0.29/163
0.84/246
2.2/241
RRF
Tributary 30
no projection, two segment
0.26/67.1
0.63/172
1.5/318
3.0/373
RRF
Tributary 32
fully equilibrated
0.73/213
RRF
distance from divide (km)
elevation (m)
Tributary 21
upper and middle segments projected
0.45/23.8
4.3/453
Tributary 23
no projection, two segment
0.72/73.9
1.4/141
6.3/687
Tributary 28
no projection, two segment
0.55/19.4
0.74/97.4
8.3/514
Tributary 29
upper and middle segments projected
0.43/30.8
1.2/79.8
3.3/106 ?
3.8/465
Tributary 31
no projection, two segment
0.37/60.6
0.18/161
2.6/252
Tributary 33
no projection, two segment
0.20/45.6
1.0/175
0.18/183
distance from divide (km)

FIGURE DR2.3

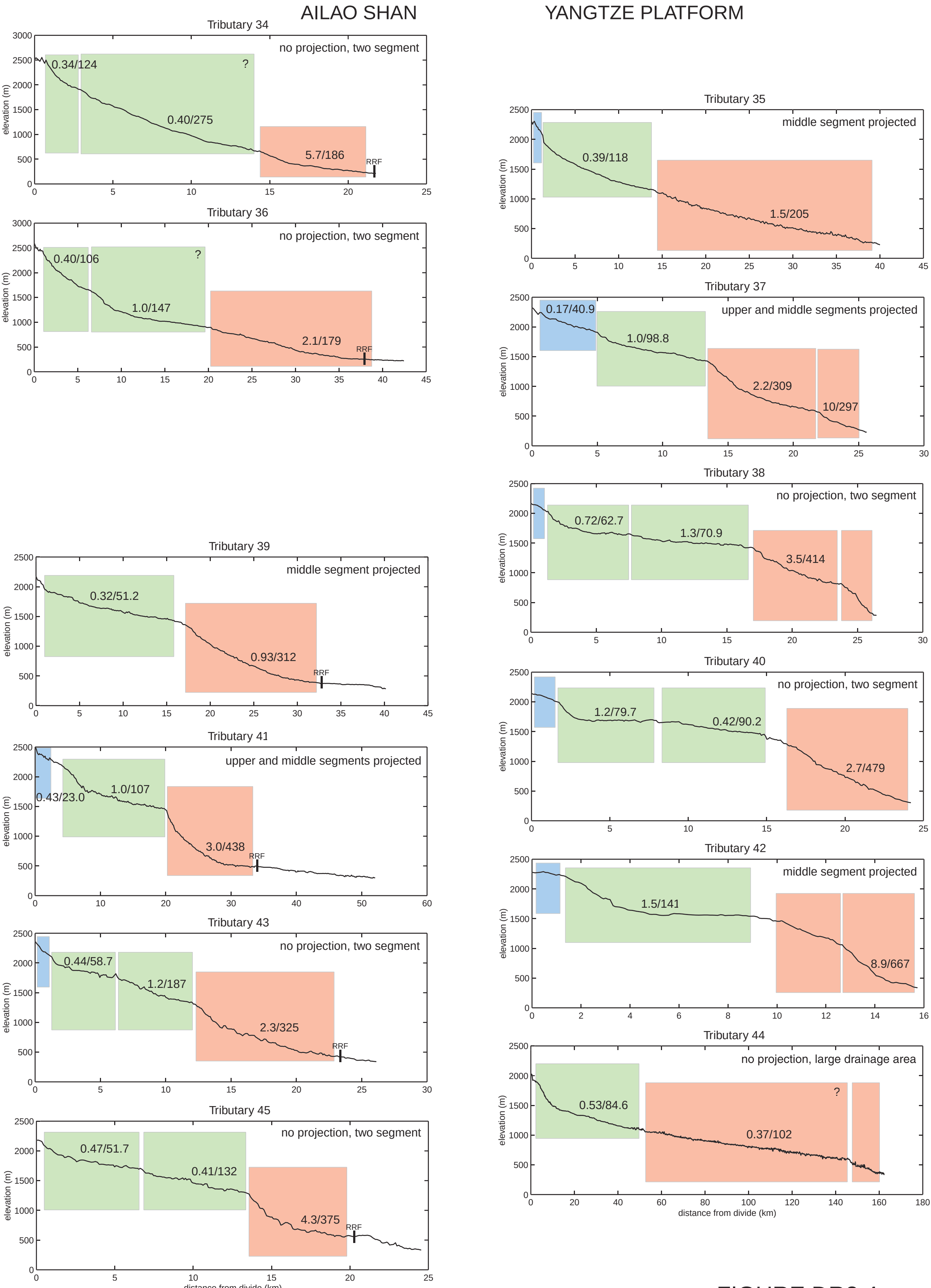

AILAO SHAN
YANGTZE PLATFORM
Tributary 34
no projection, two segment
0.34/124
0.40/275
?
5.7/186
RRF
Tributary 36
no projection, two segment
0.40/106
1.0/147
?
2.1/179
RRF
Tributary 39
middle segment projected
0.32/51.2
0.93/312
RRF
Tributary 41
upper and middle segments projected
0.43/23.0
1.0/107
3.0/438
RRF
Tributary 43
no projection, two segment
0.44/58.7
1.2/187
2.3/325
RRF
Tributary 45
no projection, two segment
0.47/51.7
0.41/132
4.3/375
RRF
Tributary 35
middle segment projected
0.39/118
1.5/205
Tributary 37
upper and middle segments projected
0.17/40.9
1.0/98.8
2.2/309
10/297
Tributary 38
no projection, two segment
0.72/62.7
1.3/70.9
3.5/414
Tributary 40
no projection, two segment
1.2/79.7
0.42/90.2
2.7/479
Tributary 42
middle segment projected
1.5/141
8.9/667
Tributary 44
no projection, large drainage area
0.53/84.6
0.37/102
?
elevation (m)
distance from divide (km)

FIGURE DR2.4

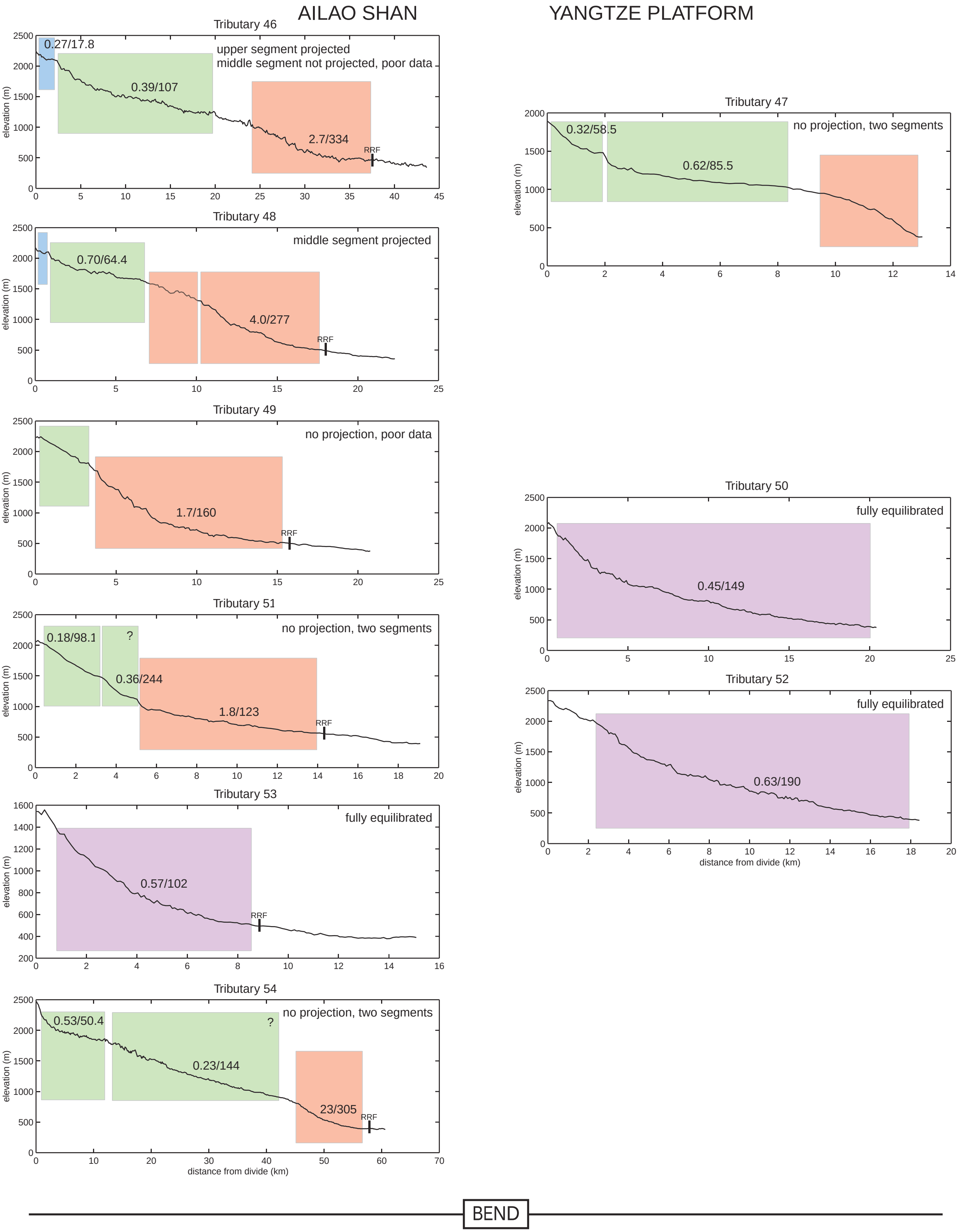

AILAO SHAN
YANGTZE PLATFORM
Tributary 46
0.27/17.8
upper segment projected
middle segment not projected, poor data
0.39/107
2.7/334
RRF
Tributary 47
0.32/58.5
no projection, two segments
0.62/85.5
Tributary 48
middle segment projected
0.70/64.4
4.0/277
RRF
Tributary 49
no projection, poor data
1.7/160
RRF
Tributary 50
fully equilibrated
0.45/149
Tributary 51
no projection, two segments
0.18/98.1
?
0.36/244
1.8/123
RRF
Tributary 52
fully equilibrated
0.63/190
Tributary 53
fully equilibrated
0.57/102
RRF
Tributary 54
no projection, two segments
0.53/50.4
?
0.23/144
23/305
RRF
elevation (m)
distance from divide (km)
BEND

FIGURE DR2.5

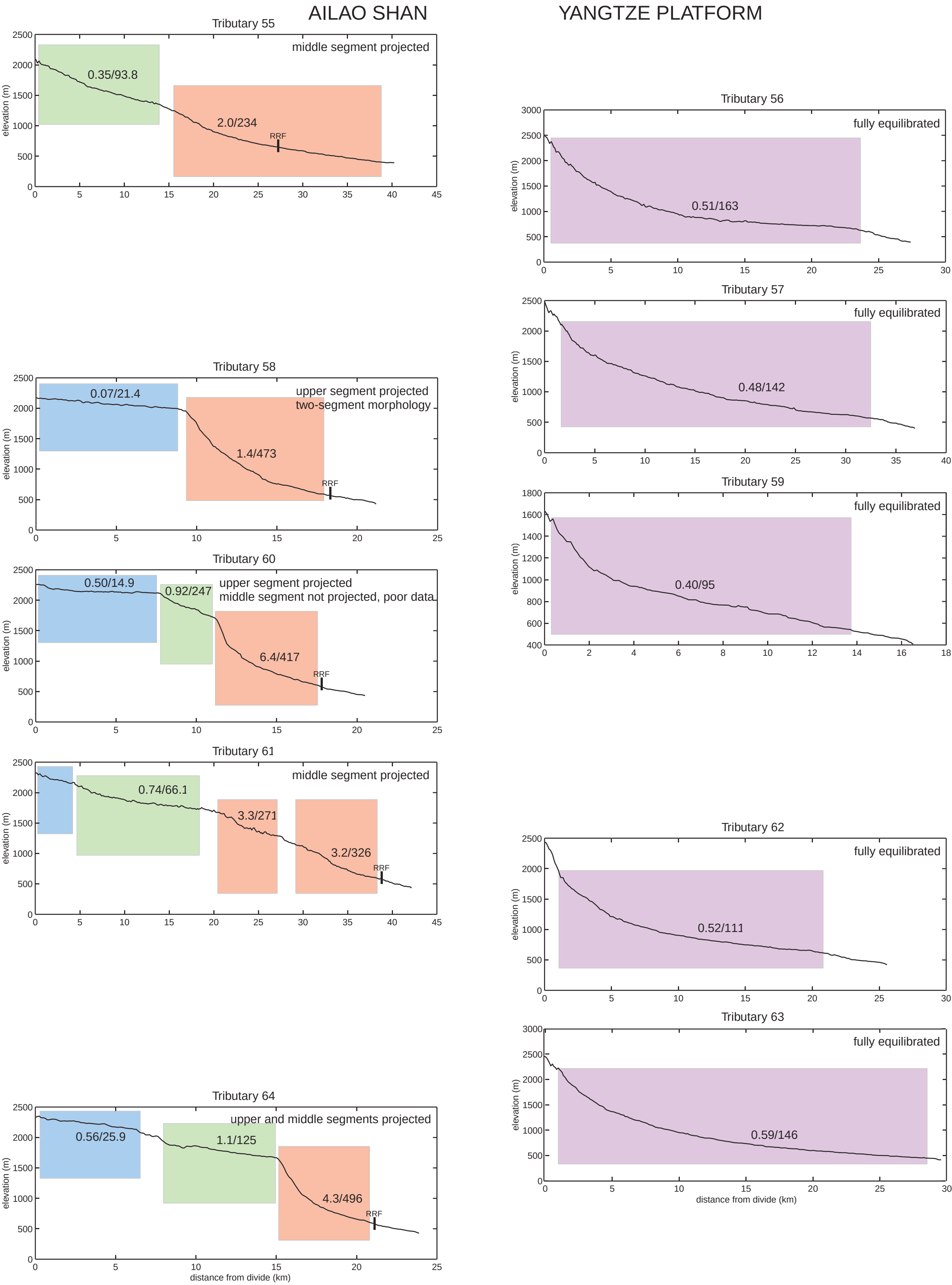

AILAO SHAN
YANGTZE PLATFORM
Tributary 55
middle segment projected
0.35/93.8
2.0/234
RRF
Tributary 58
upper segment projected
two-segment morphology
0.07/21.4
1.4/473
RRF
Tributary 60
upper segment projected
middle segment not projected, poor data
0.50/14.9
0.92/247
6.4/417
RRF
Tributary 61
middle segment projected
0.74/66.1
3.3/271
3.2/326
RRF
Tributary 64
upper and middle segments projected
0.56/25.9
1.1/125
4.3/496
RRF
Tributary 56
fully equilibrated
0.51/163
Tributary 57
fully equilibrated
0.48/142
Tributary 59
fully equilibrated
0.40/95
Tributary 62
fully equilibrated
0.52/111
Tributary 63
fully equilibrated
0.59/146
elevation (m)
distance from divide (km)

FIGURE DR2.6

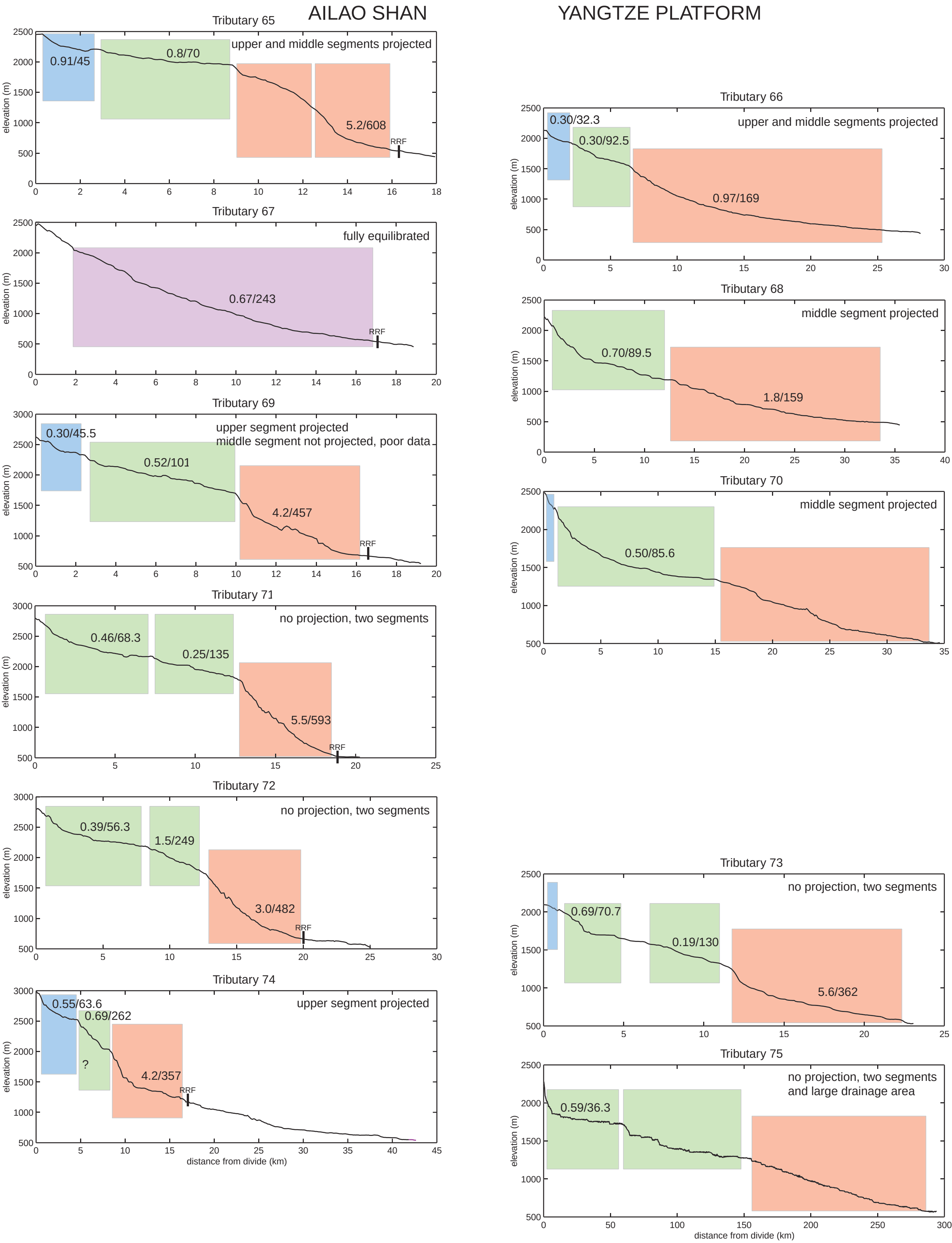

AILAO SHAN
YANGTZE PLATFORM
Tributary 65
upper and middle segments projected
0.91/45
0.8/70
5.2/608
RRF
Tributary 67
fully equilibrated
0.67/243
RRF
Tributary 69
upper segment projected
middle segment not projected, poor data
0.30/45.5
0.52/101
4.2/457
RRF
Tributary 71
no projection, two segments
0.46/68.3
0.25/135
5.5/593
RRF
Tributary 72
no projection, two segments
0.39/56.3
1.5/249
3.0/482
RRF
Tributary 74
upper segment projected
0.55/63.6
0.69/262
?
4.2/357
RRF
Tributary 66
upper and middle segments projected
0.30/32.3
0.30/92.5
0.97/169
Tributary 68
middle segment projected
0.70/89.5
1.8/159
Tributary 70
middle segment projected
0.50/85.6
Tributary 73
no projection, two segments
0.69/70.7
0.19/130
5.6/362
Tributary 75
no projection, two segments
and large drainage area
0.59/36.3
elevation (m)
distance from divide (km)

FIGURE DR2.7

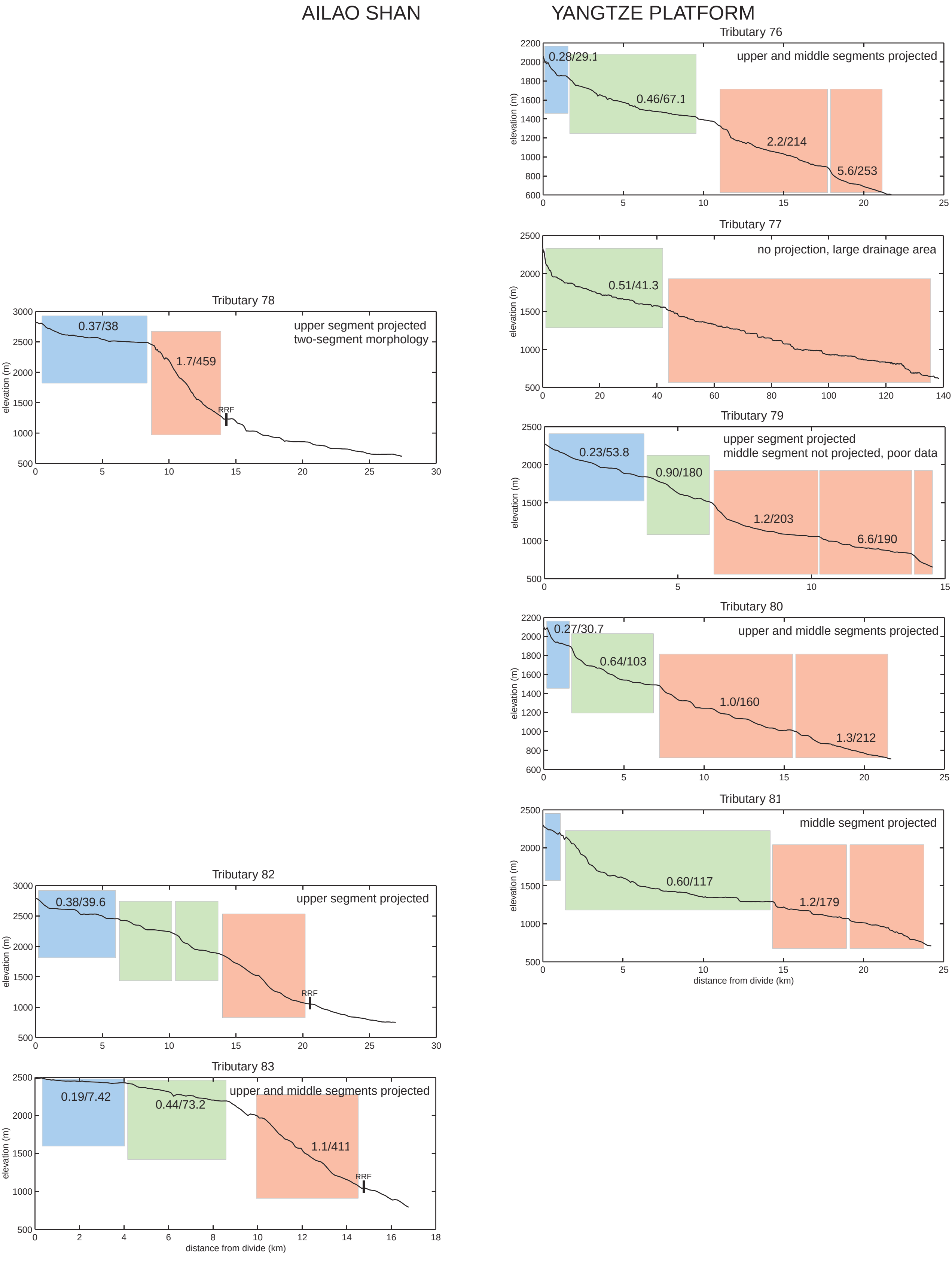

AILAO SHAN
YANGTZE PLATFORM
Tributary 76
upper and middle segments projected
0.28/29.1
0.46/67.1
2.2/214
5.6/253
Tributary 77
no projection, large drainage area
0.51/41.3
Tributary 78
upper segment projected
two-segment morphology
0.37/38
1.7/459
RRF
Tributary 79
upper segment projected
middle segment not projected, poor data
0.23/53.8
0.90/180
1.2/203
6.6/190
Tributary 80
upper and middle segments projected
0.27/30.7
0.64/103
1.0/160
1.3/212
Tributary 81
middle segment projected
0.60/117
1.2/179
Tributary 82
upper segment projected
0.38/39.6
RRF
Tributary 83
upper and middle segments projected
0.19/7.42
0.44/73.2
1.1/411
RRF
elevation (m)
distance from divide (km)

FIGURE DR 2.8

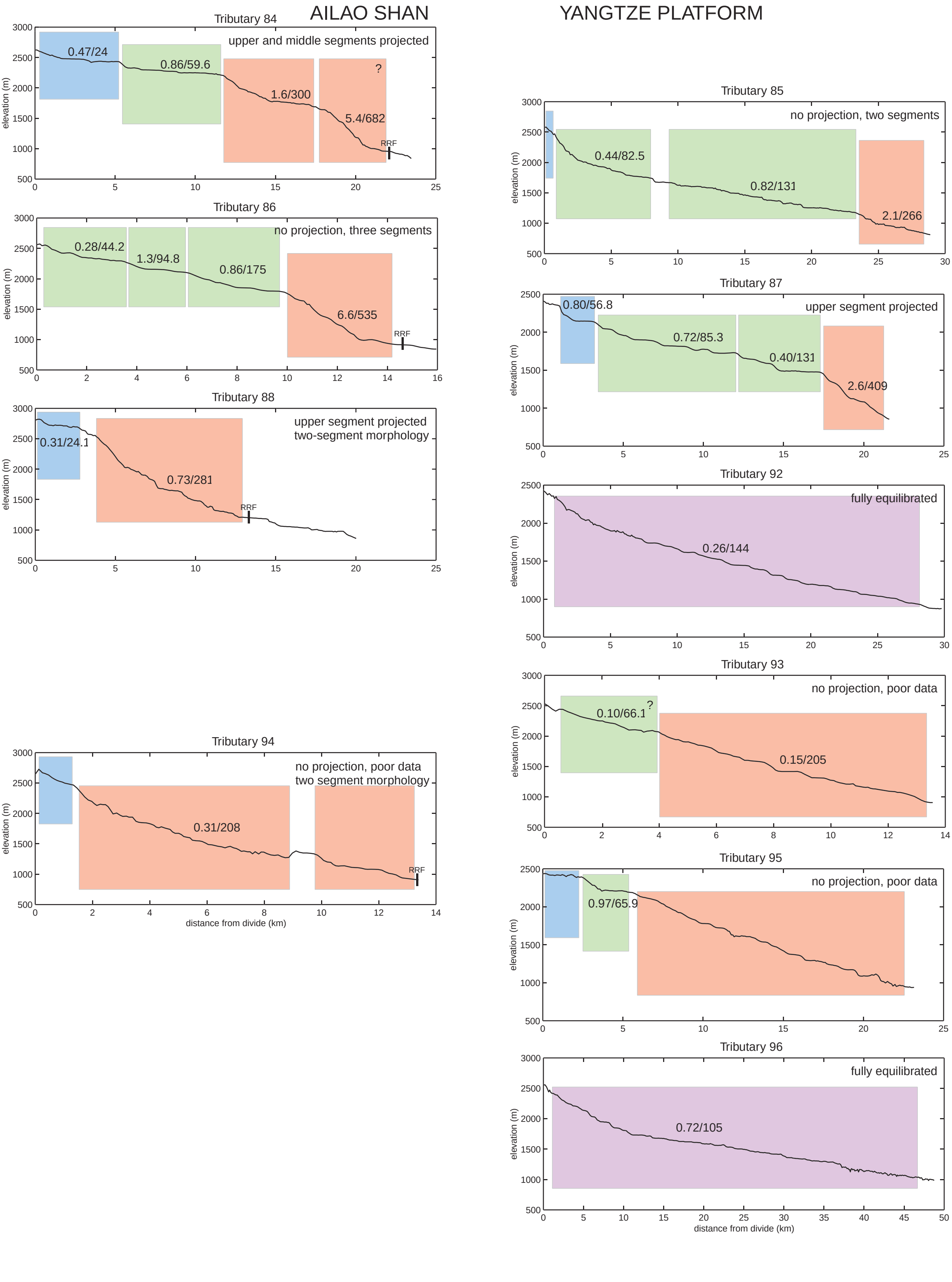

AILAO SHAN
YANGTZE PLATFORM
Tributary 84
upper and middle segments projected
0.47/24
0.86/59.6
1.6/300
5.4/682
?
RRF
Tributary 86
no projection, three segments
0.28/44.2
1.3/94.8
0.86/175
6.6/535
RRF
Tributary 88
upper segment projected
two-segment morphology
0.31/24.1
0.73/281
RRF
Tributary 94
no projection, poor data
two segment morphology
0.31/208
RRF
distance from divide (km)
elevation (m)
Tributary 85
no projection, two segments
0.44/82.5
0.82/131
2.1/266
Tributary 87
upper segment projected
0.80/56.8
0.72/85.3
0.40/131
2.6/409
Tributary 92
fully equilibrated
0.26/144
Tributary 93
no projection, poor data
0.10/66.1
?
0.15/205
Tributary 95
no projection, poor data
0.97/65.9
Tributary 96
fully equilibrated
0.72/105
distance from divide (km)

FIGURE DR2.9

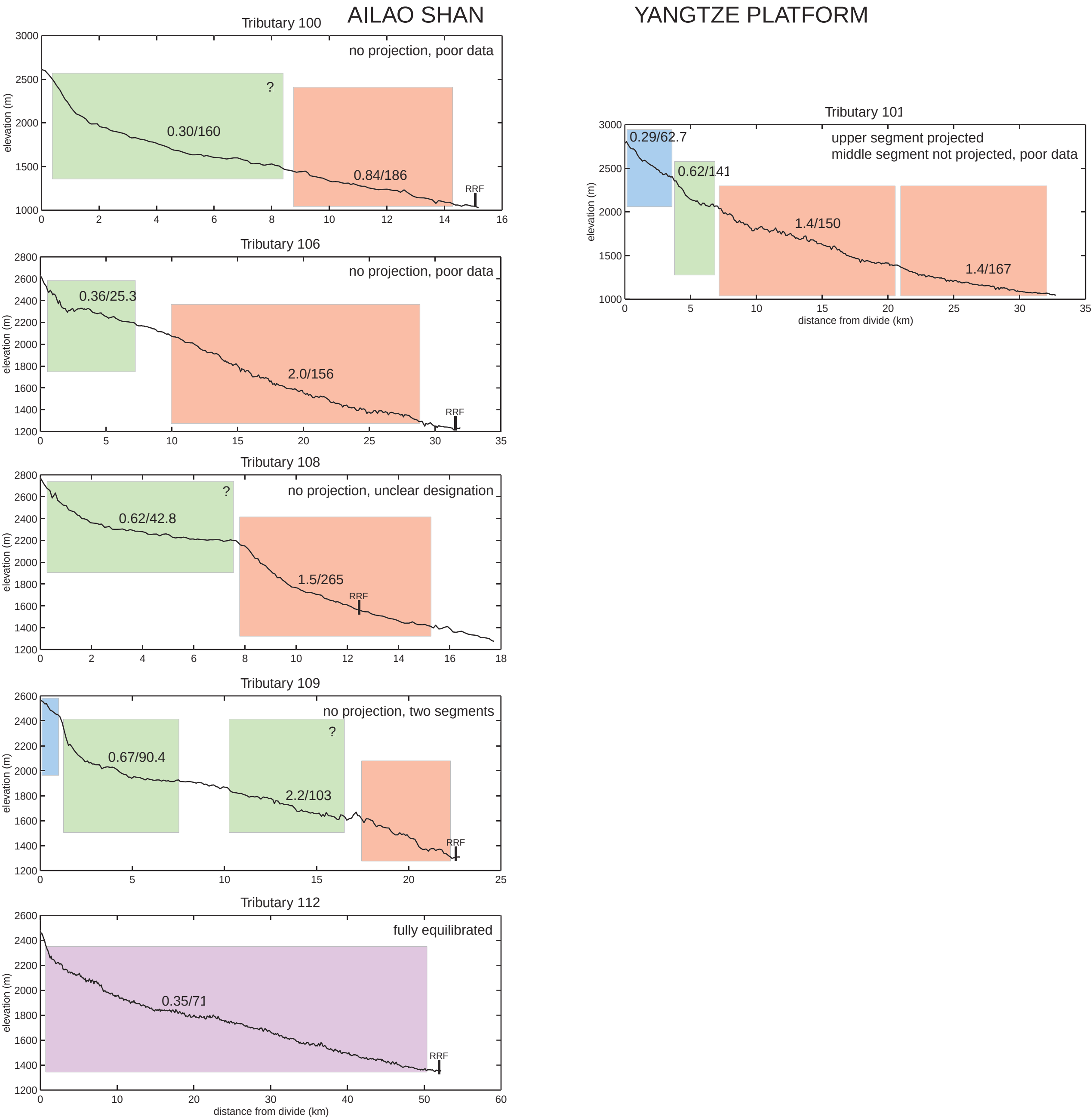


FIGURE DR2.10

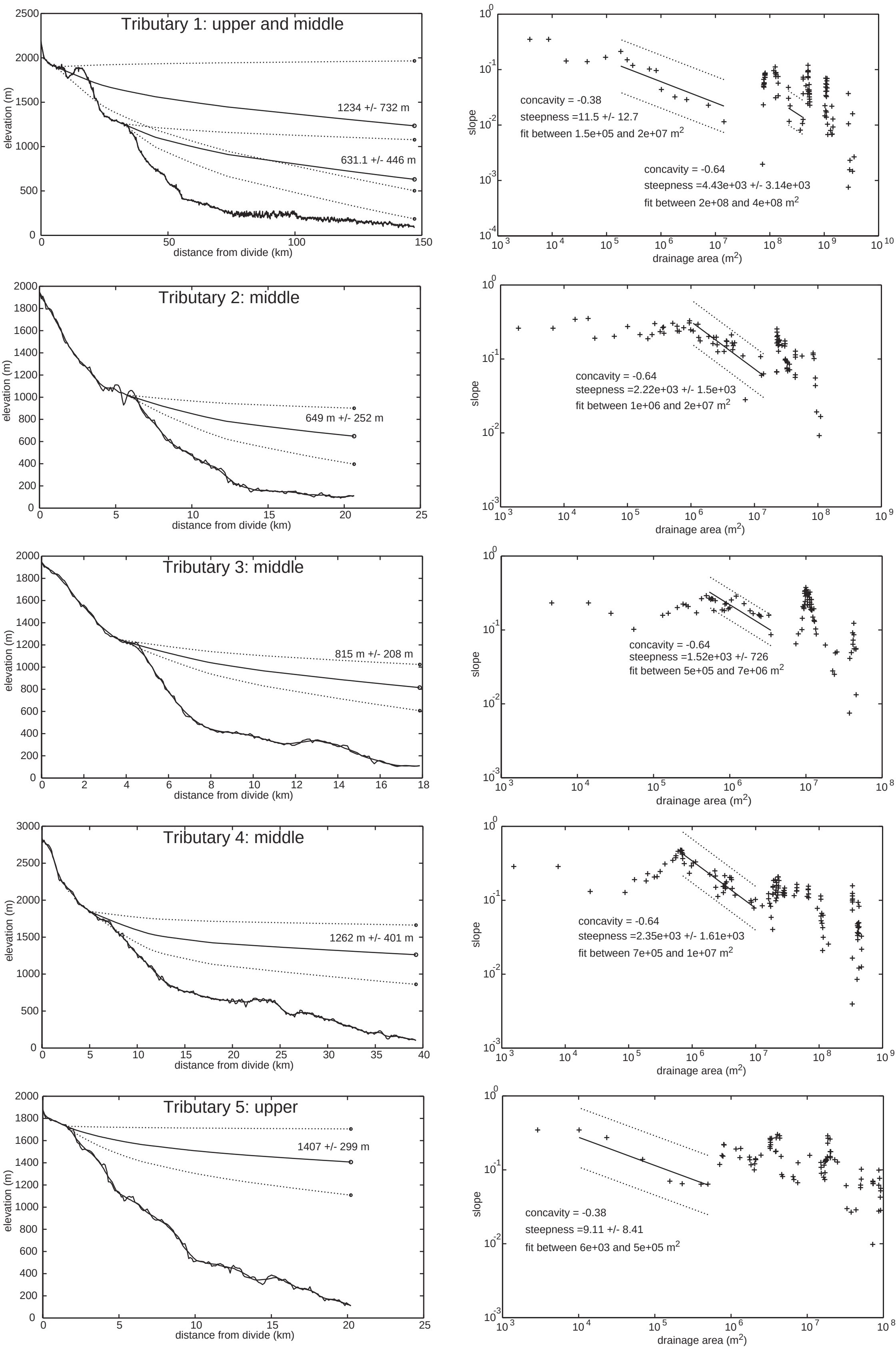

Tributary 1: upper and middle
1234 +/- 732 m
631.1 +/- 446 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =11.5 +/- 12.7
fit between 1.5e+05 and 2e+07 m^2
concavity = -0.64
steepness =4.43e+03 +/- 3.14e+03
fit between 2e+08 and 4e+08 m^2
slope
drainage area (m^2)
Tributary 2: middle
649 m +/- 252 m
concavity = -0.64
steepness =2.22e+03 +/- 1.5e+03
fit between 1e+06 and 2e+07 m^2
Tributary 3: middle
815 m +/- 208 m
concavity = -0.64
steepness =1.52e+03 +/- 726
fit between 5e+05 and 7e+06 m^2
Tributary 4: middle
1262 m +/- 401 m
concavity = -0.64
steepness =2.35e+03 +/- 1.61e+03
fit between 7e+05 and 1e+07 m^2
Tributary 5: upper
1407 +/- 299 m
concavity = -0.38
steepness =9.11 +/- 8.41
fit between 6e+03 and 5e+05 m^2

FIGURE DR3.1

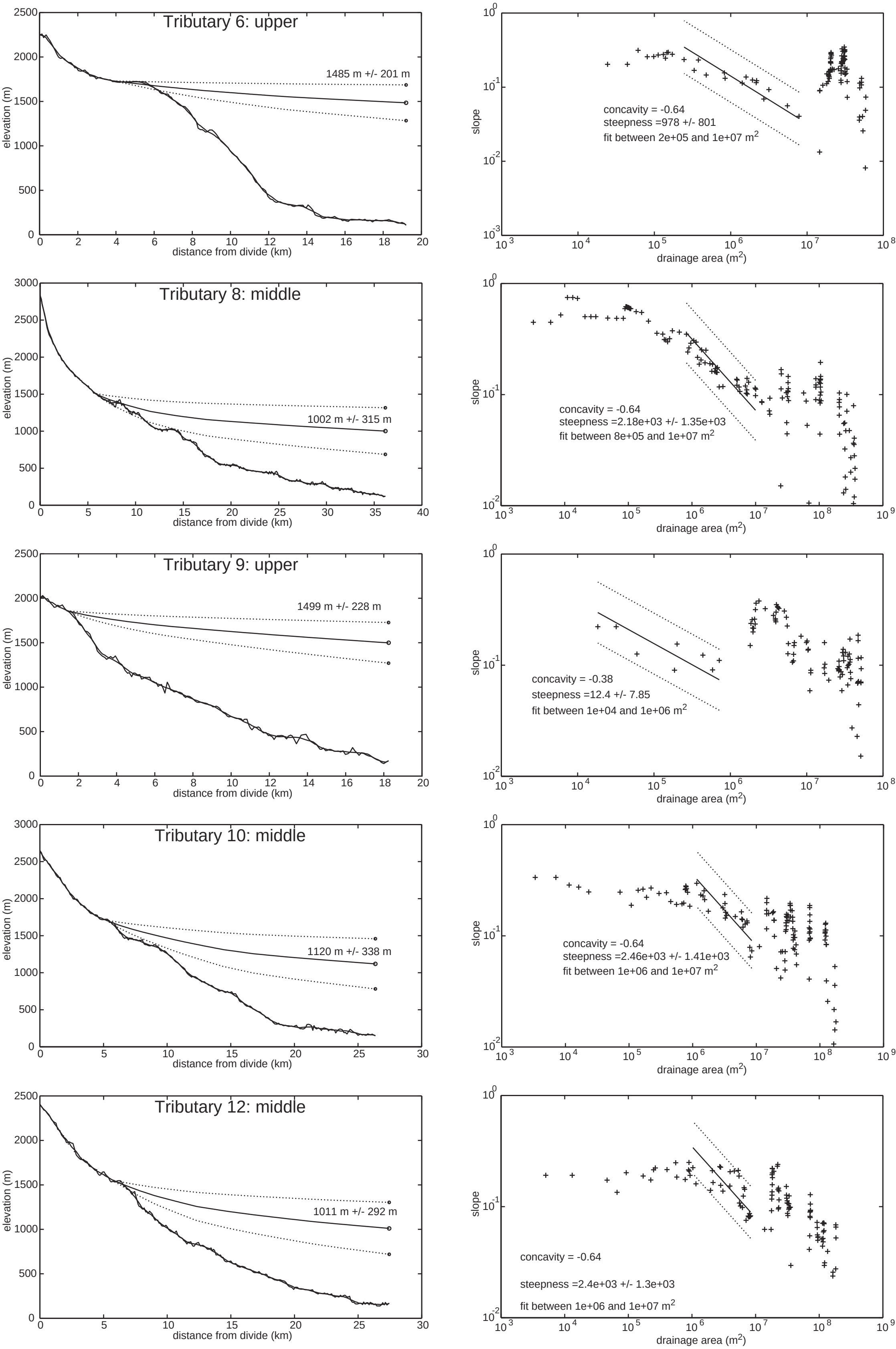

Tributary 6: upper
1485 m +/- 201 m
elevation (m)
distance from divide (km)
concavity = -0.64
steepness =978 +/- 801
fit between 2e+05 and 1e+07 m^2
slope
drainage area (m^2)
Tributary 8: middle
1002 m +/- 315 m
concavity = -0.64
steepness =2.18e+03 +/- 1.35e+03
fit between 8e+05 and 1e+07 m^2
Tributary 9: upper
1499 m +/- 228 m
concavity = -0.38
steepness =12.4 +/- 7.85
fit between 1e+04 and 1e+06 m^2
Tributary 10: middle
1120 m +/- 338 m
concavity = -0.64
steepness =2.46e+03 +/- 1.41e+03
fit between 1e+06 and 1e+07 m^2
Tributary 12: middle
1011 m +/- 292 m
concavity = -0.64
steepness =2.4e+03 +/- 1.3e+03
fit between 1e+06 and 1e+07 m^2

FIGURE DR3.2

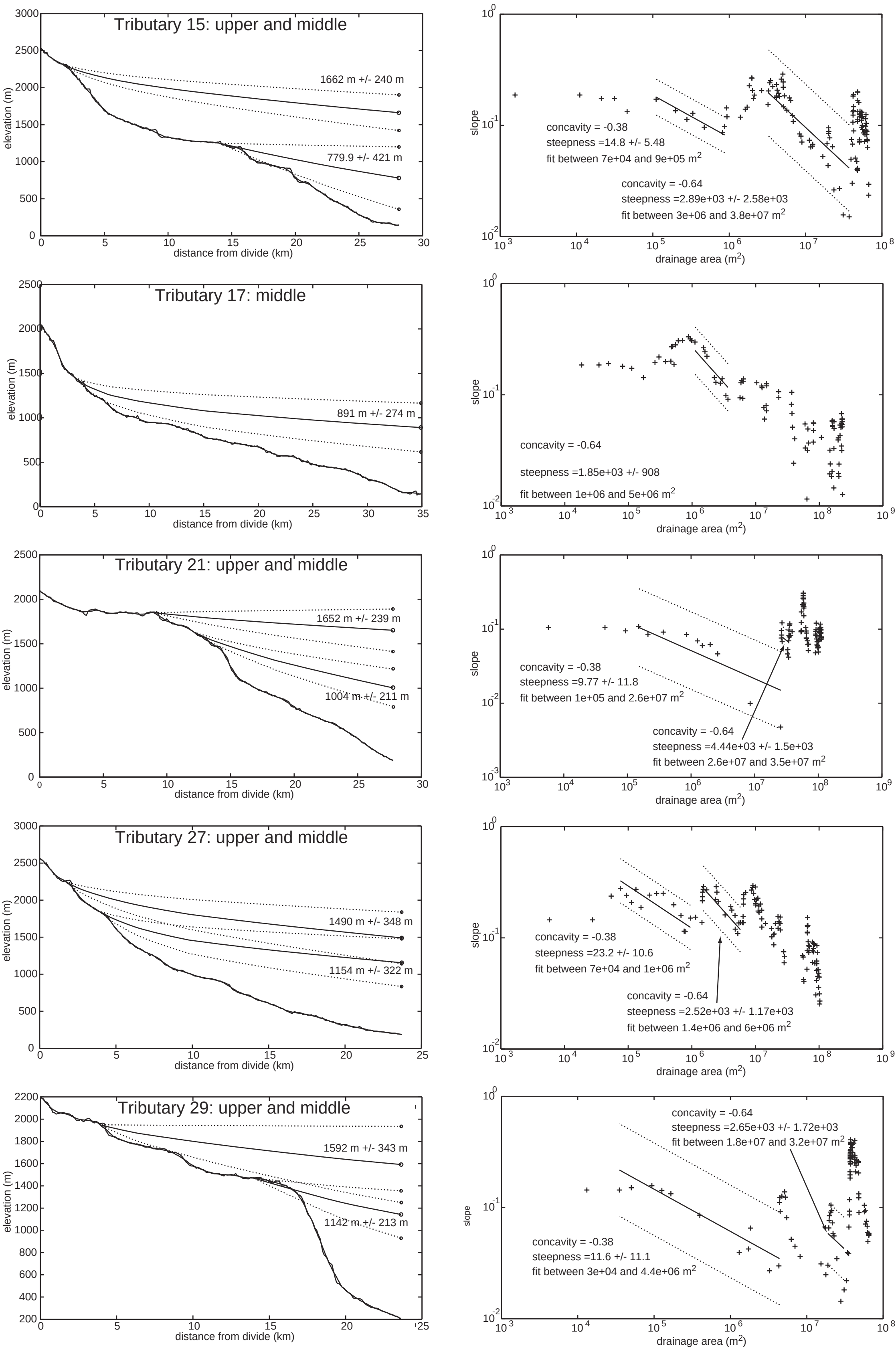
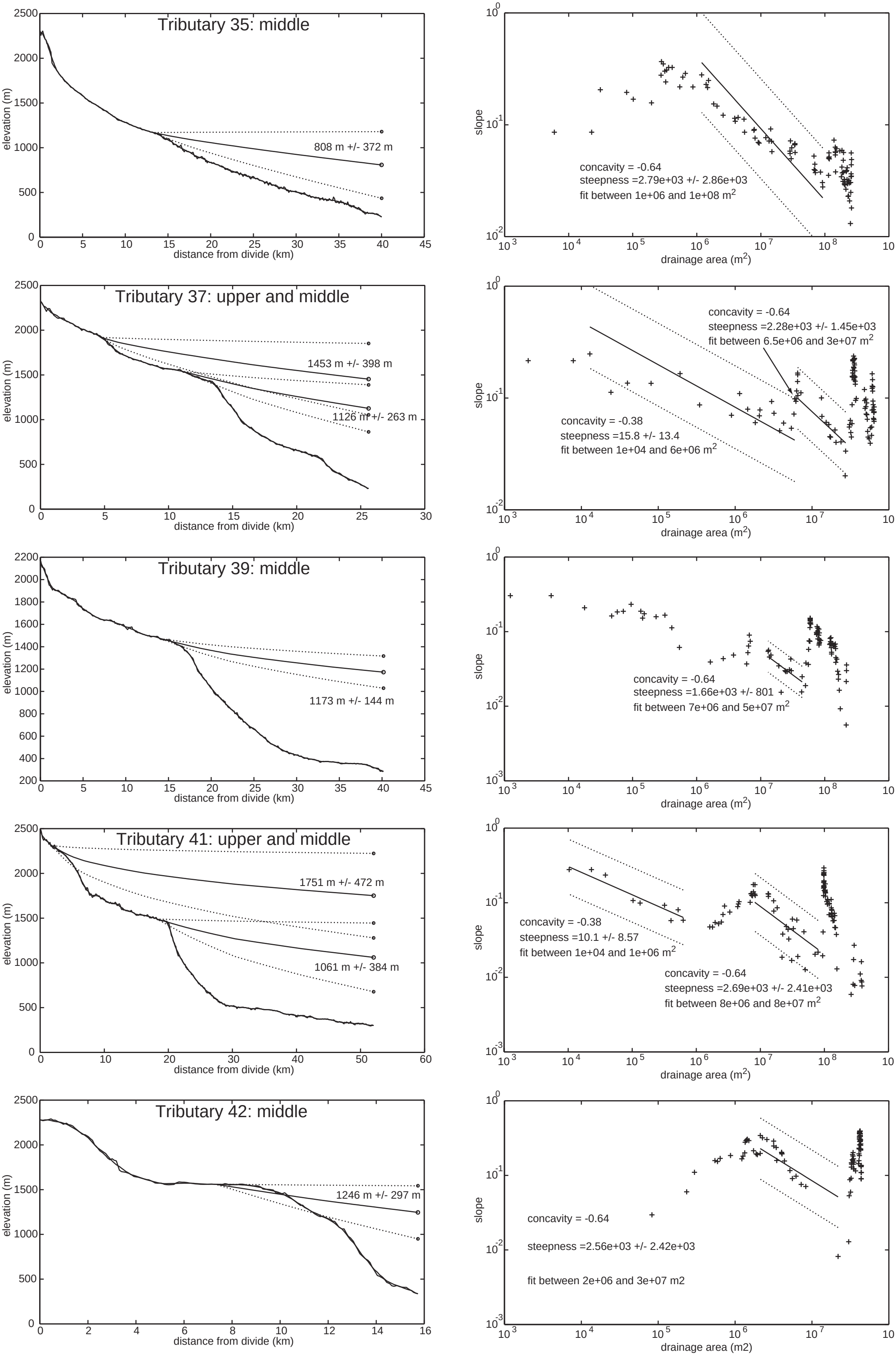

Tributary 15: upper and middle
1662 m +/- 240 m
779.9 +/- 421 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =14.8 +/- 5.48
fit between 7e+04 and 9e+05 m^2
concavity = -0.64
steepness =2.89e+03 +/- 2.58e+03
fit between 3e+06 and 3.8e+07 m^2
slope
drainage area (m^2)
Tributary 17: middle
891 m +/- 274 m
concavity = -0.64
steepness =1.85e+03 +/- 908
fit between 1e+06 and 5e+06 m^2
Tributary 21: upper and middle
1652 m +/- 239 m
1004 m +/- 211 m
concavity = -0.38
steepness =9.77 +/- 11.8
fit between 1e+05 and 2.6e+07 m^2
concavity = -0.64
steepness =4.44e+03 +/- 1.5e+03
fit between 2.6e+07 and 3.5e+07 m^2
Tributary 27: upper and middle
1490 m +/- 348 m
1154 m +/- 322 m
concavity = -0.38
steepness =23.2 +/- 10.6
fit between 7e+04 and 1e+06 m^2
concavity = -0.64
steepness =2.52e+03 +/- 1.17e+03
fit between 1.4e+06 and 6e+06 m^2
Tributary 29: upper and middle
1592 m +/- 343 m
1142 m +/- 213 m
concavity = -0.64
steepness =2.65e+03 +/- 1.72e+03
fit between 1.8e+07 and 3.2e+07 m^2
concavity = -0.38
steepness =11.6 +/- 11.1
fit between 3e+04 and 4.4e+06 m^2

FIGURE DR3.3



Tributary 35: middle
808 m +/- 372 m
elevation (m)
distance from divide (km)
slope
drainage area (m^2)
concavity = -0.64
steepness =2.79e+03 +/- 2.86e+03
fit between 1e+06 and 1e+08 m^2
Tributary 37: upper and middle
1453 m +/- 398 m
1126 m +/- 263 m
concavity = -0.64
steepness =2.28e+03 +/- 1.45e+03
fit between 6.5e+06 and 3e+07 m^2
concavity = -0.38
steepness =15.8 +/- 13.4
fit between 1e+04 and 6e+06 m^2
Tributary 39: middle
1173 m +/- 144 m
concavity = -0.64
steepness =1.66e+03 +/- 801
fit between 7e+06 and 5e+07 m^2
Tributary 41: upper and middle
1751 m +/- 472 m
1061 m +/- 384 m
concavity = -0.38
steepness =10.1 +/- 8.57
fit between 1e+04 and 1e+06 m^2
concavity = -0.64
steepness =2.69e+03 +/- 2.41e+03
fit between 8e+06 and 8e+07 m^2
Tributary 42: middle
1246 m +/- 297 m
concavity = -0.64
steepness =2.56e+03 +/- 2.42e+03
fit between 2e+06 and 3e+07 m2
drainage area (m2)

FIGURE DR3.4

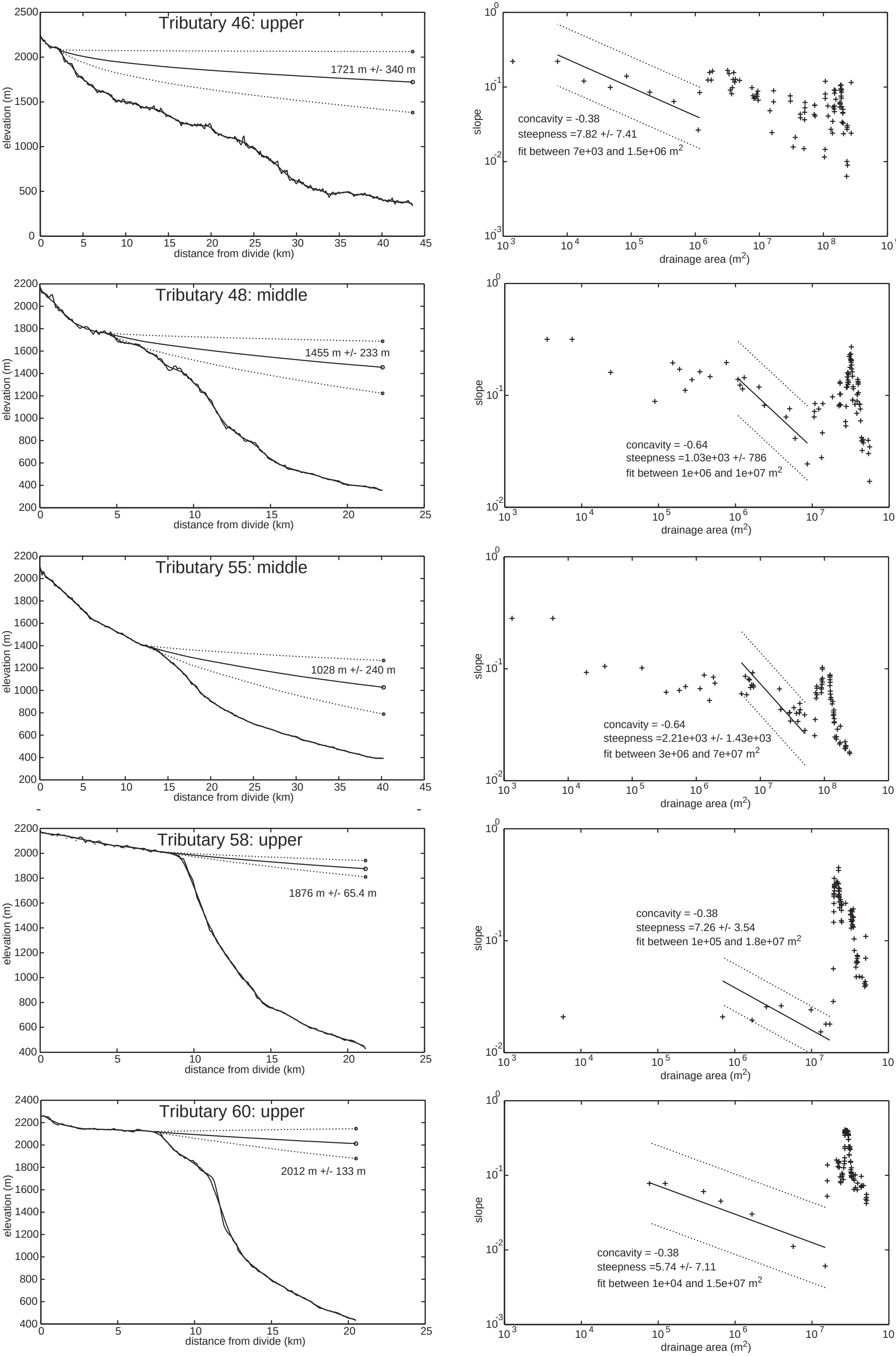

Tributary 46: upper
1721 m +/- 340 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =7.82 +/- 7.41
fit between 7e+03 and 1.5e+06 m^2
slope
drainage area (m^2)
Tributary 48: middle
1455 m +/- 233 m
elevation (m)
distance from divide (km)
concavity = -0.64
steepness =1.03e+03 +/- 786
fit between 1e+06 and 1e+07 m^2
slope
drainage area (m^2)
Tributary 55: middle
1028 m +/- 240 m
elevation (m)
distance from divide (km)
concavity = -0.64
steepness =2.21e+03 +/- 1.43e+03
fit between 3e+06 and 7e+07 m^2
slope
drainage area (m^2)
Tributary 58: upper
1876 m +/- 65.4 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =7.26 +/- 3.54
fit between 1e+05 and 1.8e+07 m^2
slope
drainage area (m^2)
Tributary 60: upper
2012 m +/- 133 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =5.74 +/- 7.11
fit between 1e+04 and 1.5e+07 m^2
slope
drainage area (m^2)

FIGURE DR3.5

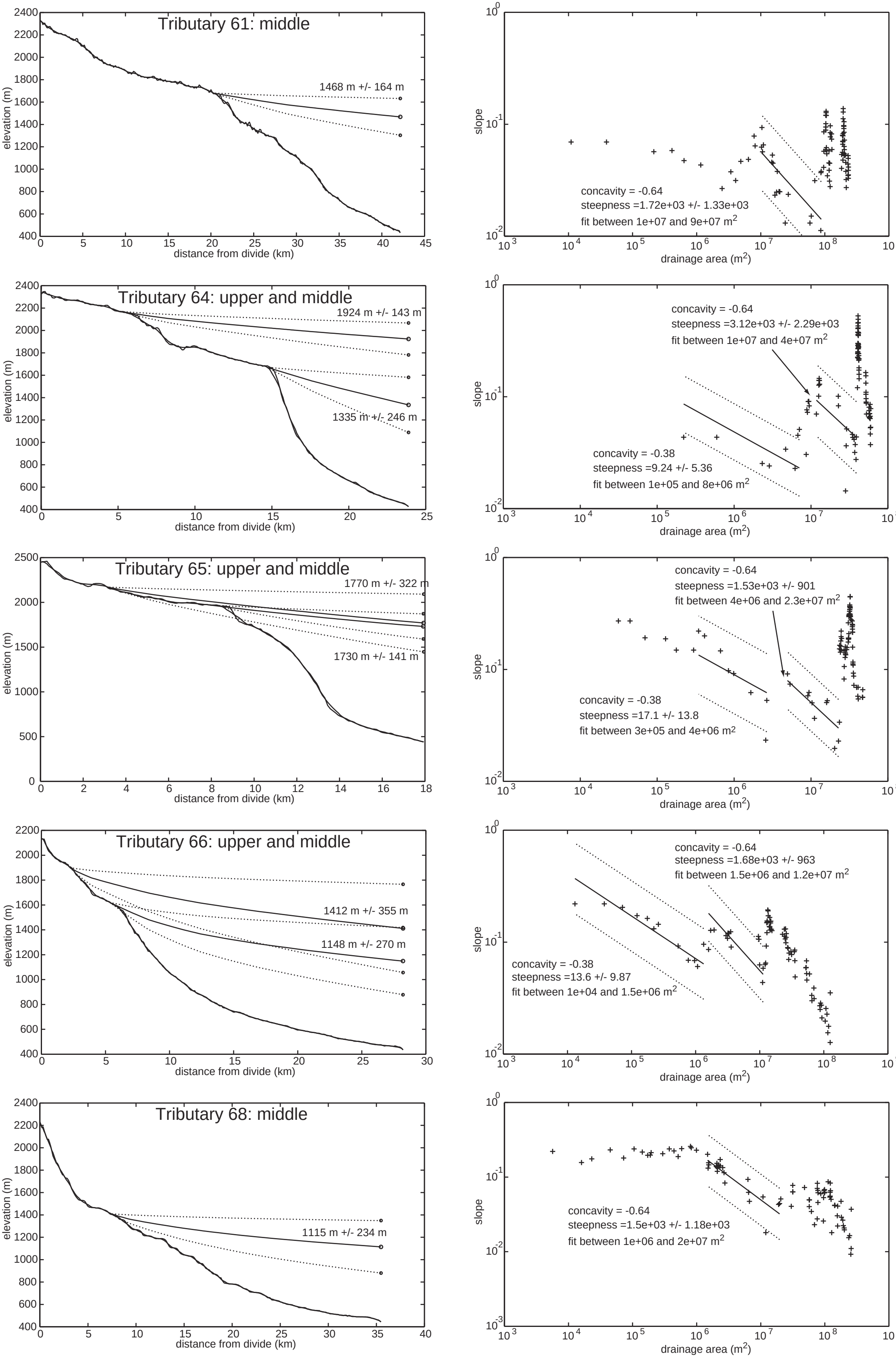
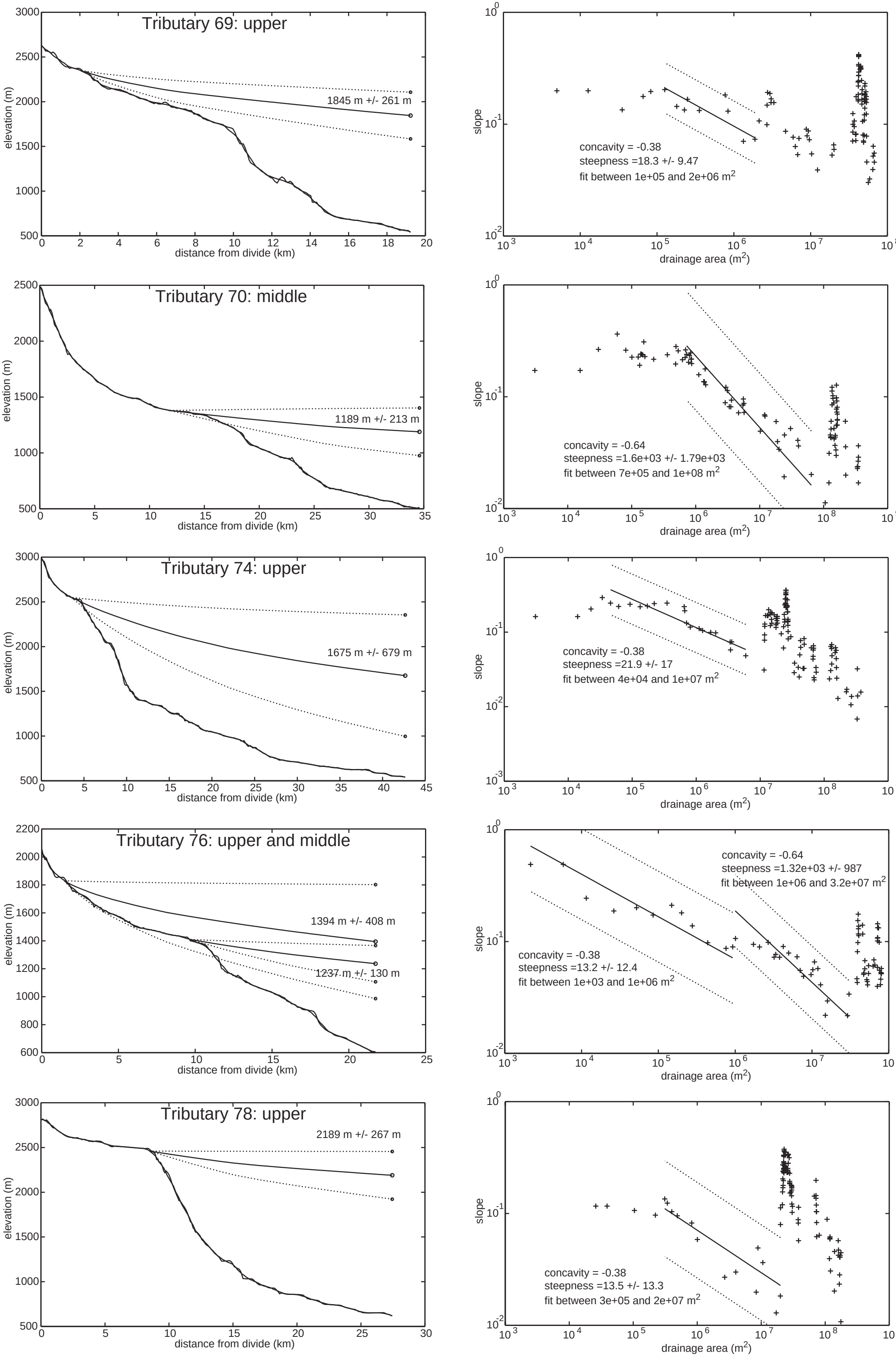
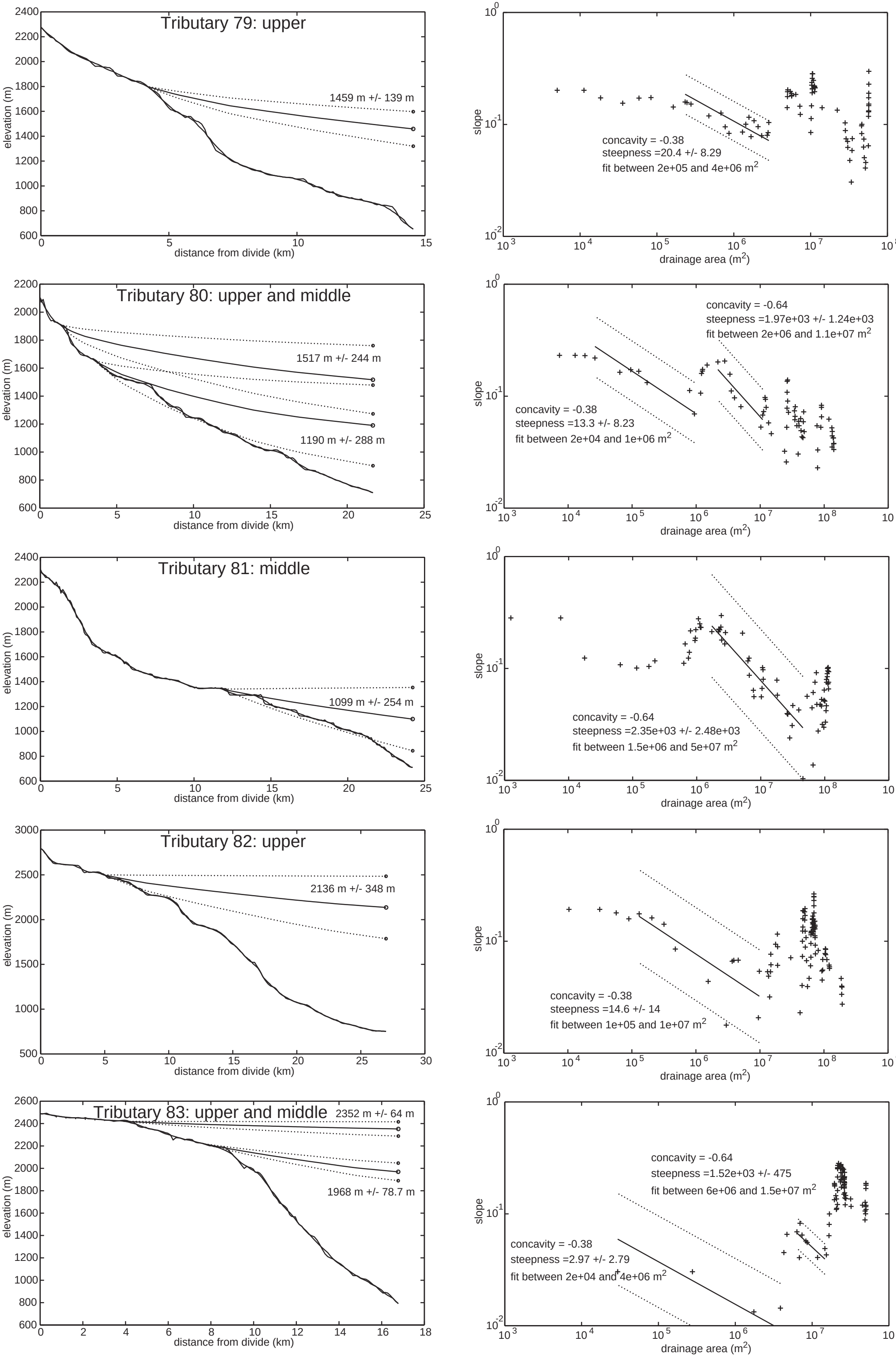

Tributary 61: middle
1468 m +/- 164 m
elevation (m)
distance from divide (km)
slope
drainage area (m2)
concavity = -0.64
steepness =1.72e+03 +/- 1.33e+03
fit between 1e+07 and 9e+07 m2
Tributary 64: upper and middle
1924 m +/- 143 m
1335 m +/- 246 m
concavity = -0.64
steepness =3.12e+03 +/- 2.29e+03
fit between 1e+07 and 4e+07 m2
concavity = -0.38
steepness =9.24 +/- 5.36
fit between 1e+05 and 8e+06 m2
Tributary 65: upper and middle
1770 m +/- 322 m
1730 m +/- 141 m
concavity = -0.64
steepness =1.53e+03 +/- 901
fit between 4e+06 and 2.3e+07 m2
concavity = -0.38
steepness =17.1 +/- 13.8
fit between 3e+05 and 4e+06 m2
Tributary 66: upper and middle
1412 m +/- 355 m
1148 m +/- 270 m
concavity = -0.64
steepness =1.68e+03 +/- 963
fit between 1.5e+06 and 1.2e+07 m2
concavity = -0.38
steepness =13.6 +/- 9.87
fit between 1e+04 and 1.5e+06 m2
Tributary 68: middle
1115 m +/- 234 m
concavity = -0.64
steepness =1.5e+03 +/- 1.18e+03
fit between 1e+06 and 2e+07 m2

FIGURE DR3.6



Tributary 69: upper
1845 m +/- 261 m
concavity = -0.38
steepness =18.3 +/- 9.47
fit between 1e+05 and 2e+06 m2
Tributary 70: middle
1189 m +/- 213 m
concavity = -0.64
steepness =1.6e+03 +/- 1.79e+03
fit between 7e+05 and 1e+08 m2
Tributary 74: upper
1675 m +/- 679 m
concavity = -0.38
steepness =21.9 +/- 17
fit between 4e+04 and 1e+07 m2
Tributary 76: upper and middle
1394 m +/- 408 m
1237 m +/- 130 m
concavity = -0.64
steepness =1.32e+03 +/- 987
fit between 1e+06 and 3.2e+07 m2
concavity = -0.38
steepness =13.2 +/- 12.4
fit between 1e+03 and 1e+06 m2
Tributary 78: upper
2189 m +/- 267 m
concavity = -0.38
steepness =13.5 +/- 13.3
fit between 3e+05 and 2e+07 m2
elevation (m)
distance from divide (km)
slope
drainage area (m2)

FIGURE DR3.7



Tributary 79: upper
1459 m +/- 139 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =20.4 +/- 8.29
fit between 2e+05 and 4e+06 m2
slope
drainage area (m2)
Tributary 80: upper and middle
1517 m +/- 244 m
1190 m +/- 288 m
concavity = -0.64
steepness =1.97e+03 +/- 1.24e+03
fit between 2e+06 and 1.1e+07 m2
concavity = -0.38
steepness =13.3 +/- 8.23
fit between 2e+04 and 1e+06 m2
Tributary 81: middle
1099 m +/- 254 m
concavity = -0.64
steepness =2.35e+03 +/- 2.48e+03
fit between 1.5e+06 and 5e+07 m2
Tributary 82: upper
2136 m +/- 348 m
concavity = -0.38
steepness =14.6 +/- 14
fit between 1e+05 and 1e+07 m2
Tributary 83: upper and middle
2352 m +/- 64 m
1968 m +/- 78.7 m
concavity = -0.64
steepness =1.52e+03 +/- 475
fit between 6e+06 and 1.5e+07 m2
concavity = -0.38
steepness =2.97 +/- 2.79
fit between 2e+04 and 4e+06 m2

FIGURE DR3.8

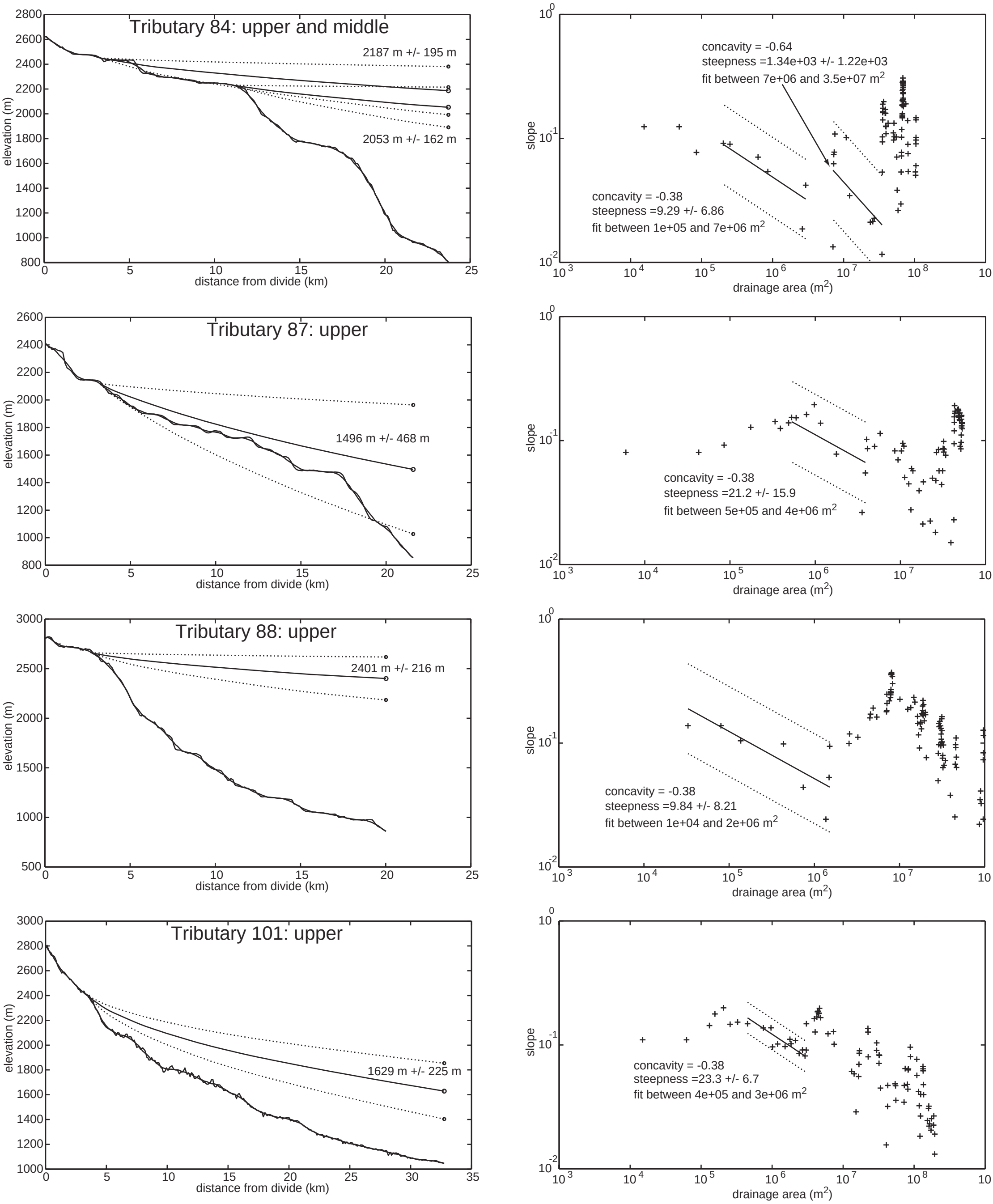

Tributary 84: upper and middle
2187 m +/- 195 m
2053 m +/- 162 m
elevation (m)
distance from divide (km)
concavity = -0.64
steepness =1.34e+03 +/- 1.22e+03
fit between 7e+06 and 3.5e+07 m2
concavity = -0.38
steepness =9.29 +/- 6.86
fit between 1e+05 and 7e+06 m2
slope
drainage area (m2)
Tributary 87: upper
1496 m +/- 468 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =21.2 +/- 15.9
fit between 5e+05 and 4e+06 m2
slope
drainage area (m2)
Tributary 88: upper
2401 m +/- 216 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =9.84 +/- 8.21
fit between 1e+04 and 2e+06 m2
slope
drainage area (m2)
Tributary 101: upper
1629 m +/- 225 m
elevation (m)
distance from divide (km)
concavity = -0.38
steepness =23.3 +/- 6.7
fit between 4e+05 and 3e+06 m2
slope
drainage area (m2)

FIGURE DR3.9