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Supplement of

Parameter estimation of river incision models of soft sedimentary rocks – a case study on the Kamikita Coastal Plain, northeast Japan

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S1: Profiles of the marine terrace surfaces and detailed maps of the location for erosion rate data point

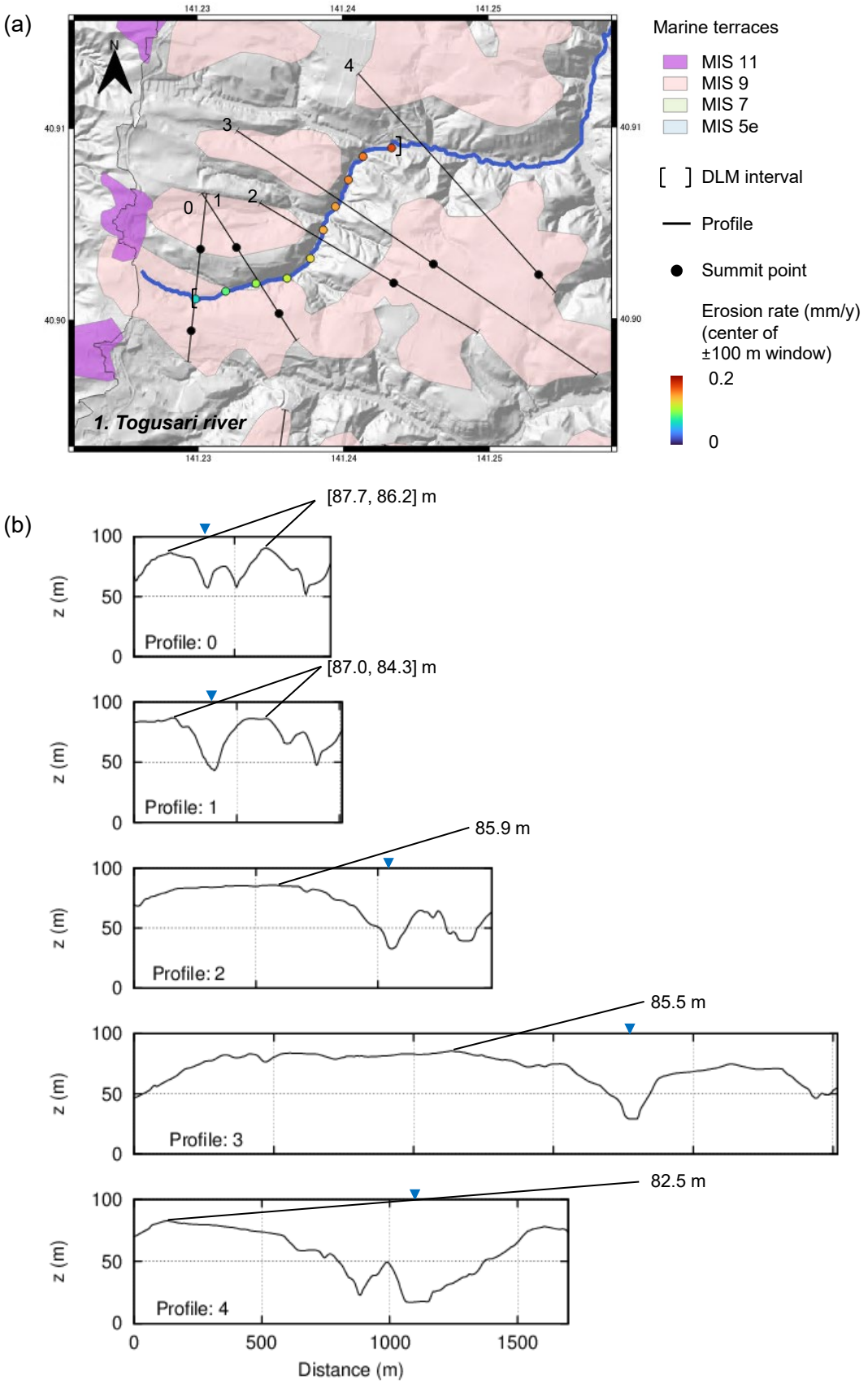

Figure S1: Data for River No.1. (a) Locations of summit levels (black points) extracted from profiles of the marine terrace surfaces (black lines) and representative points for estimated erosion rates (colored circles). (b) Profiles with riverbed locations (blue triangles).

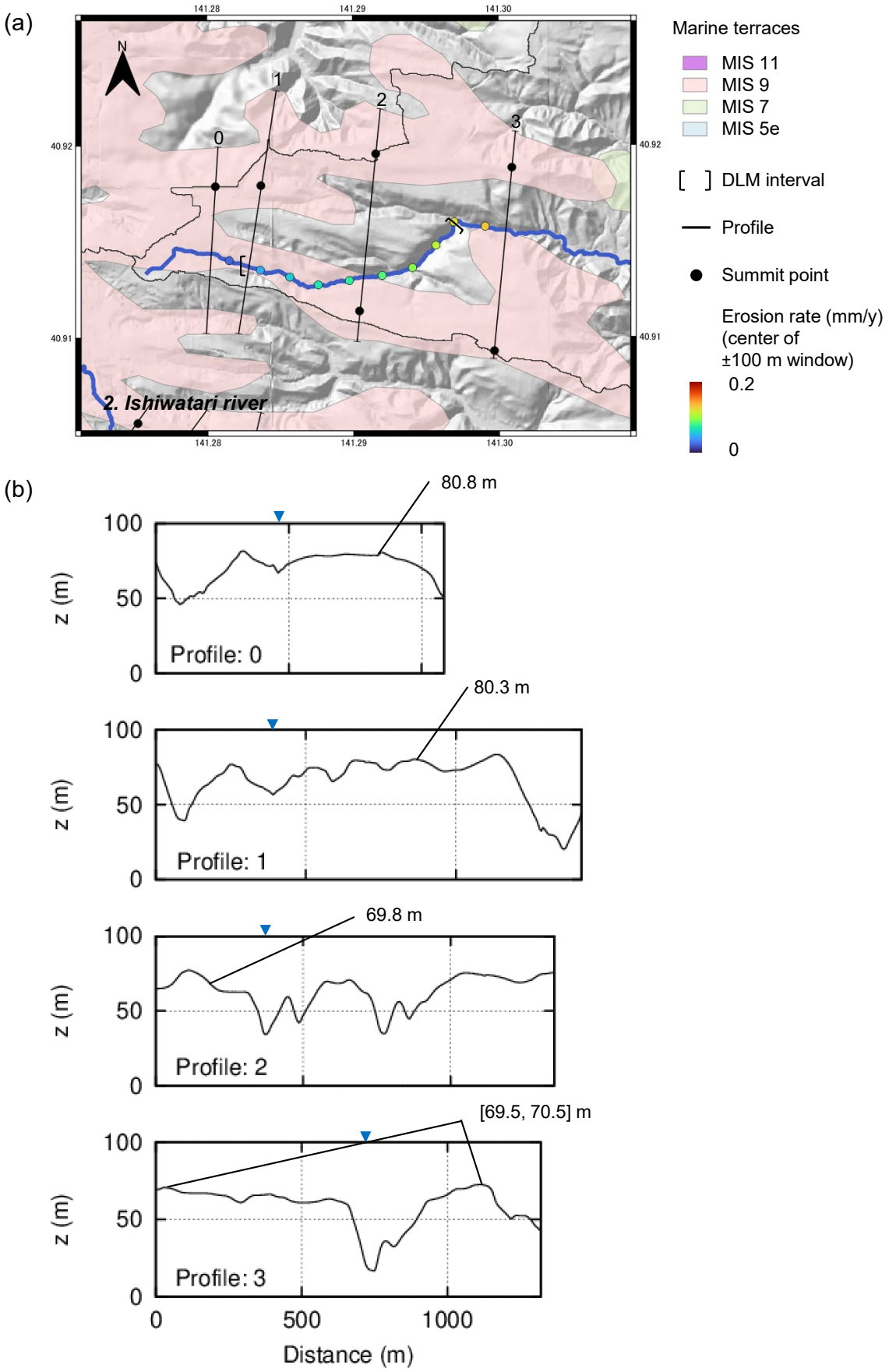

Figure S2: Data for River No.2. Symbols and lines are the same as in Fig. S1.

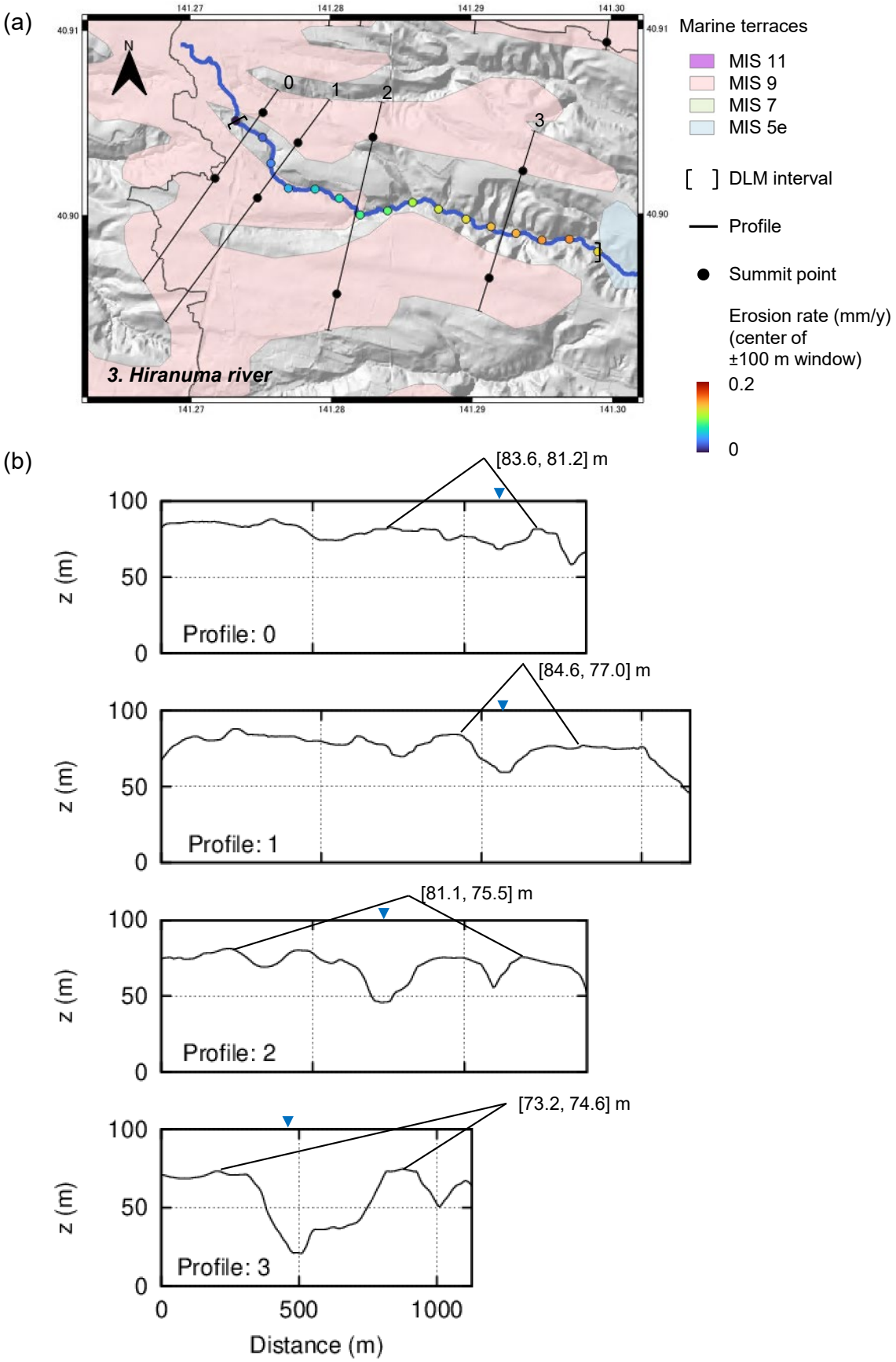

Figure S3: Data for River No.3. Symbols and lines are the same as in Fig. S1.

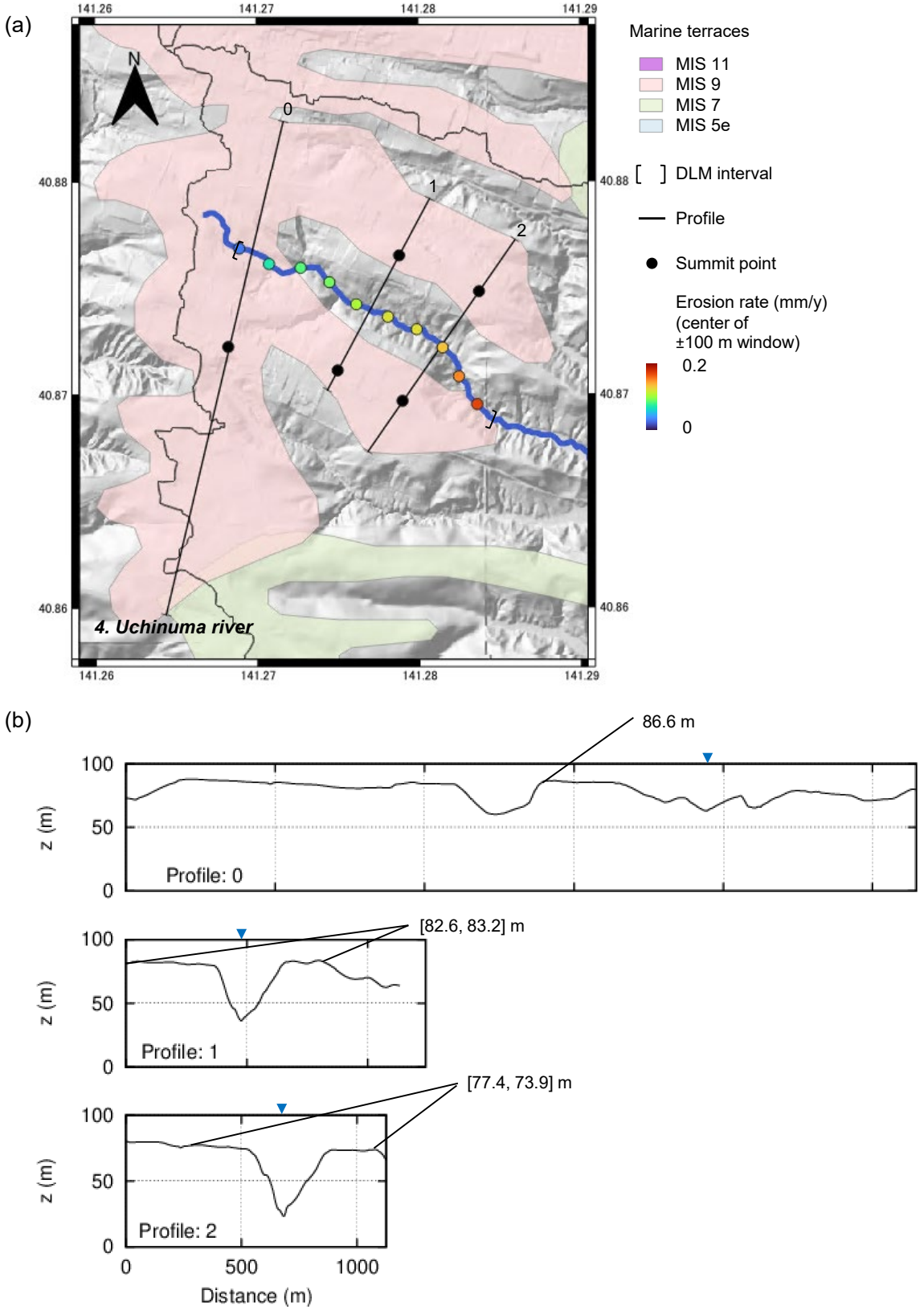

Figure S4: Data for River No.4. Symbols and lines are the same as in Fig. S1.

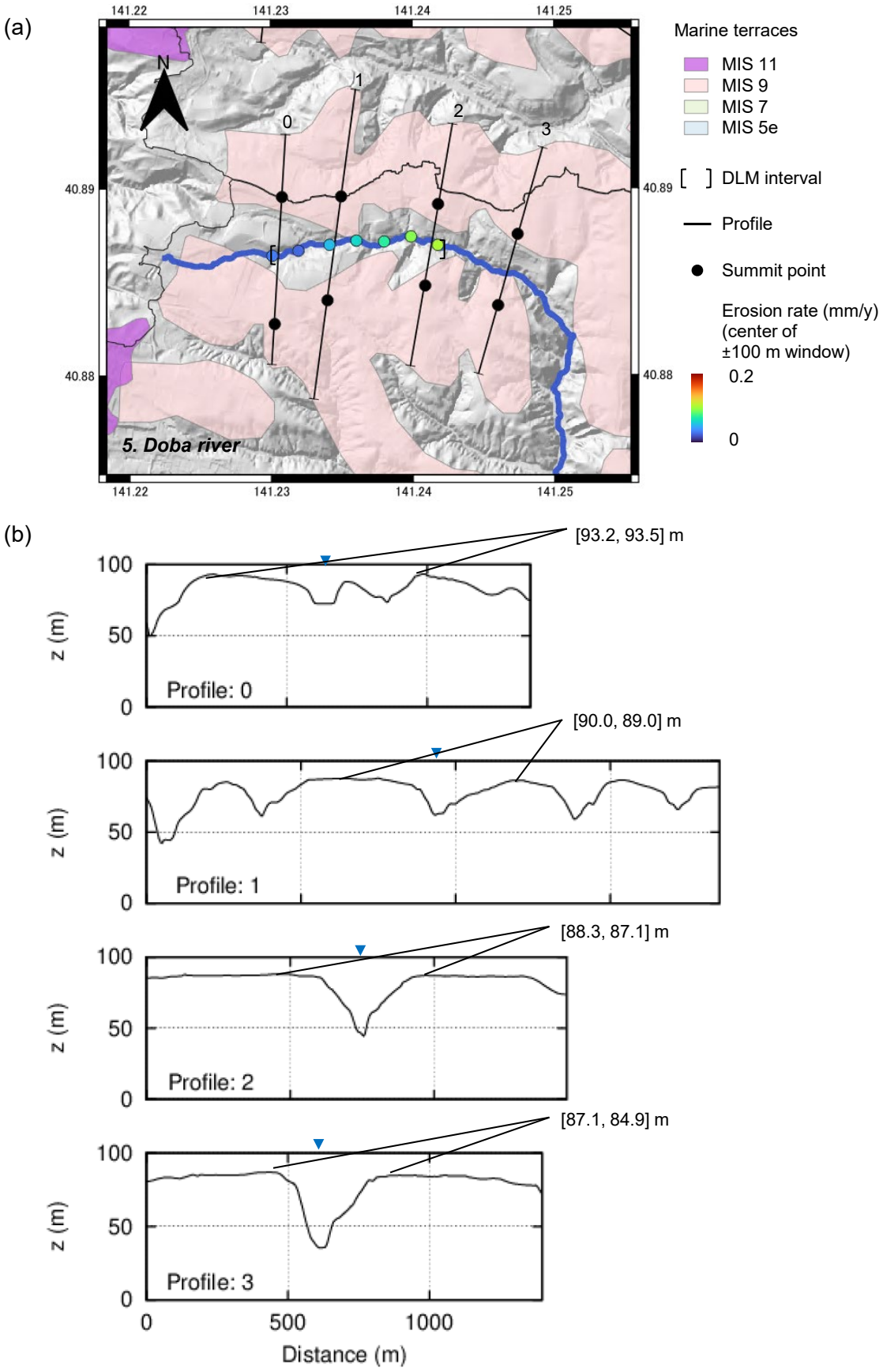

Figure S5: Data for River No.5. Symbols and lines are the same as in Fig. S1.

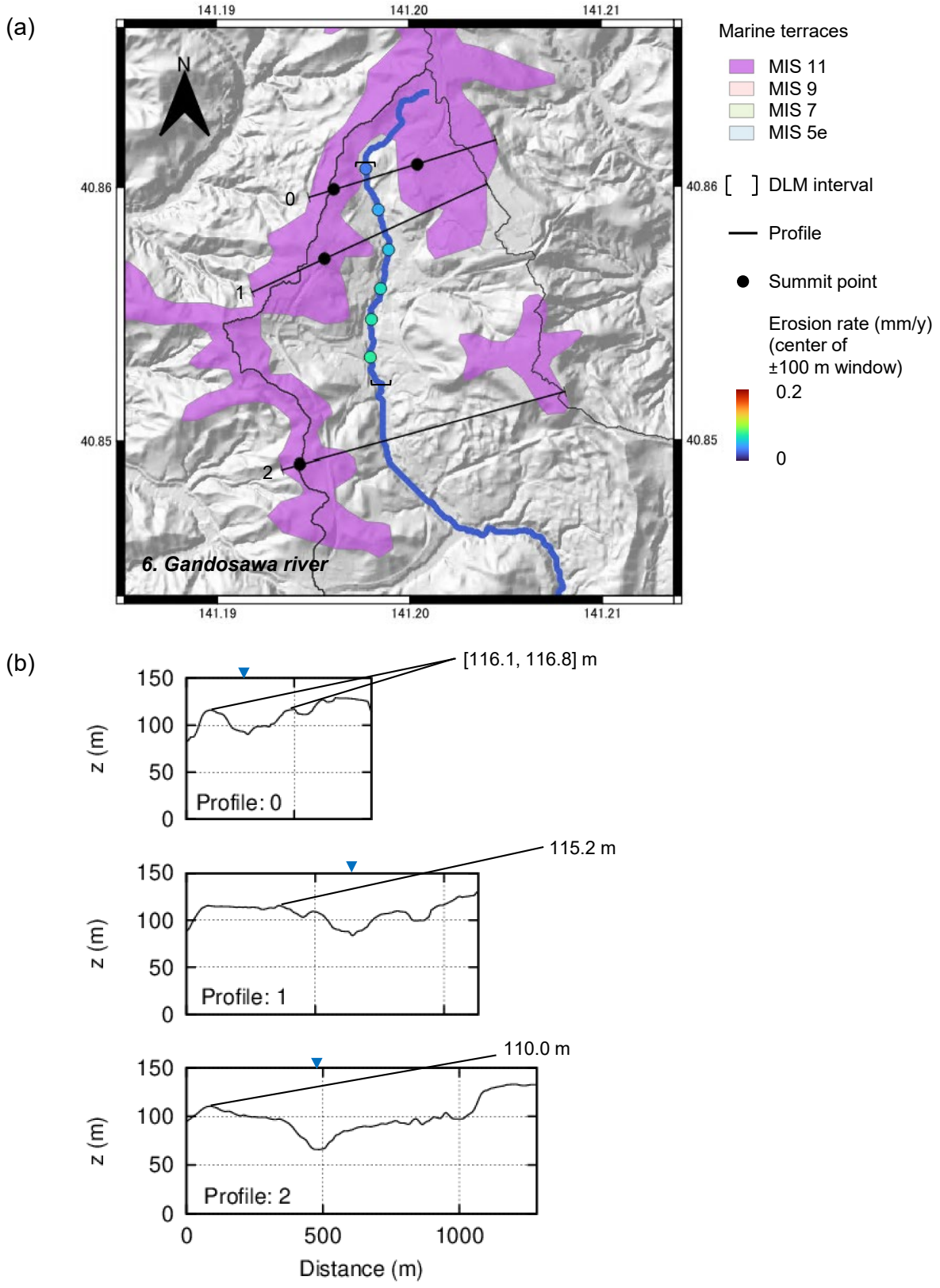

Figure S6: Data for River No.6. Symbols and lines are the same as in Fig. S1.

S2: Outcrop locations investigated by AIST(2015, 2016)

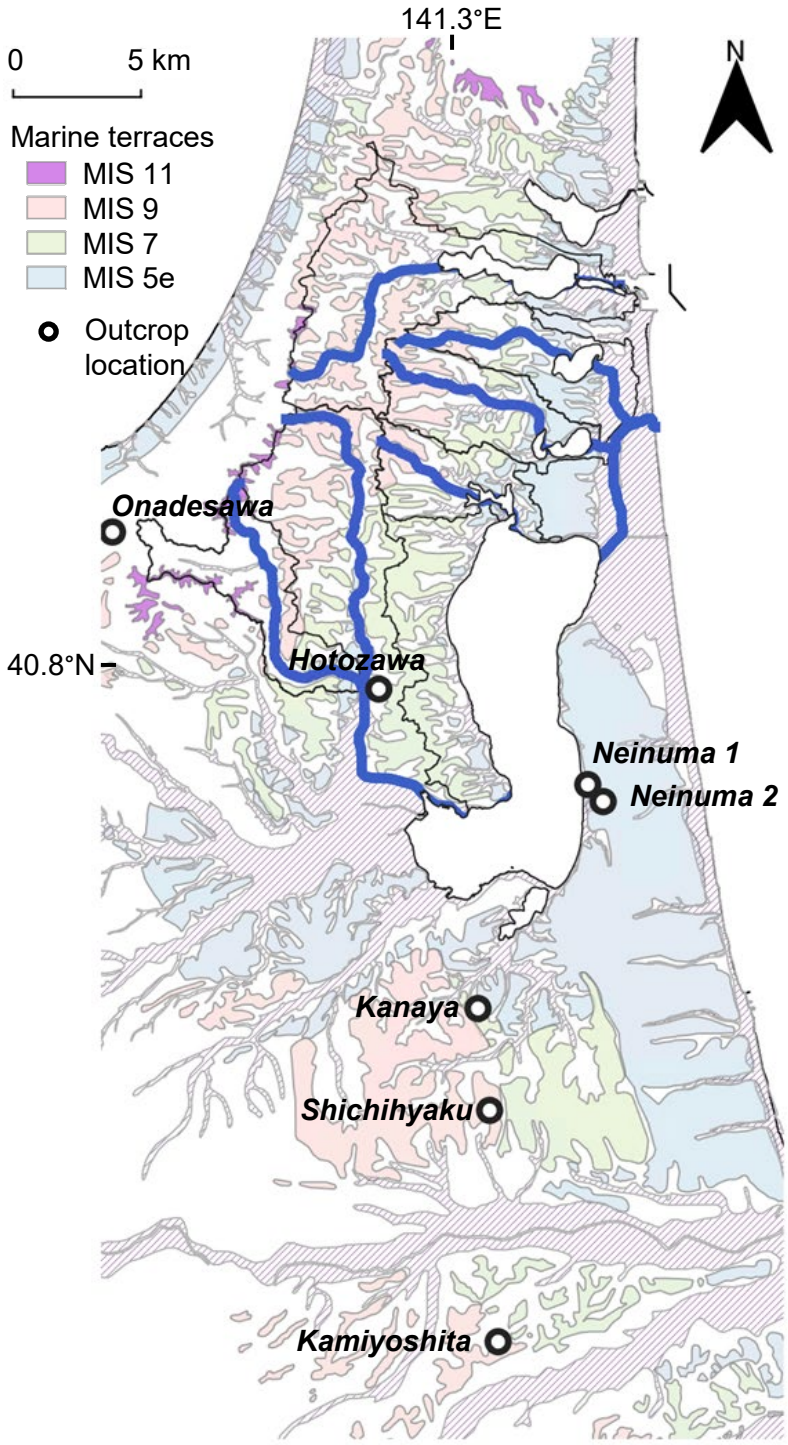

Figure S7: Outcrop locations investigated by AIST (2015, 2016).

S3: AICc values for each target river

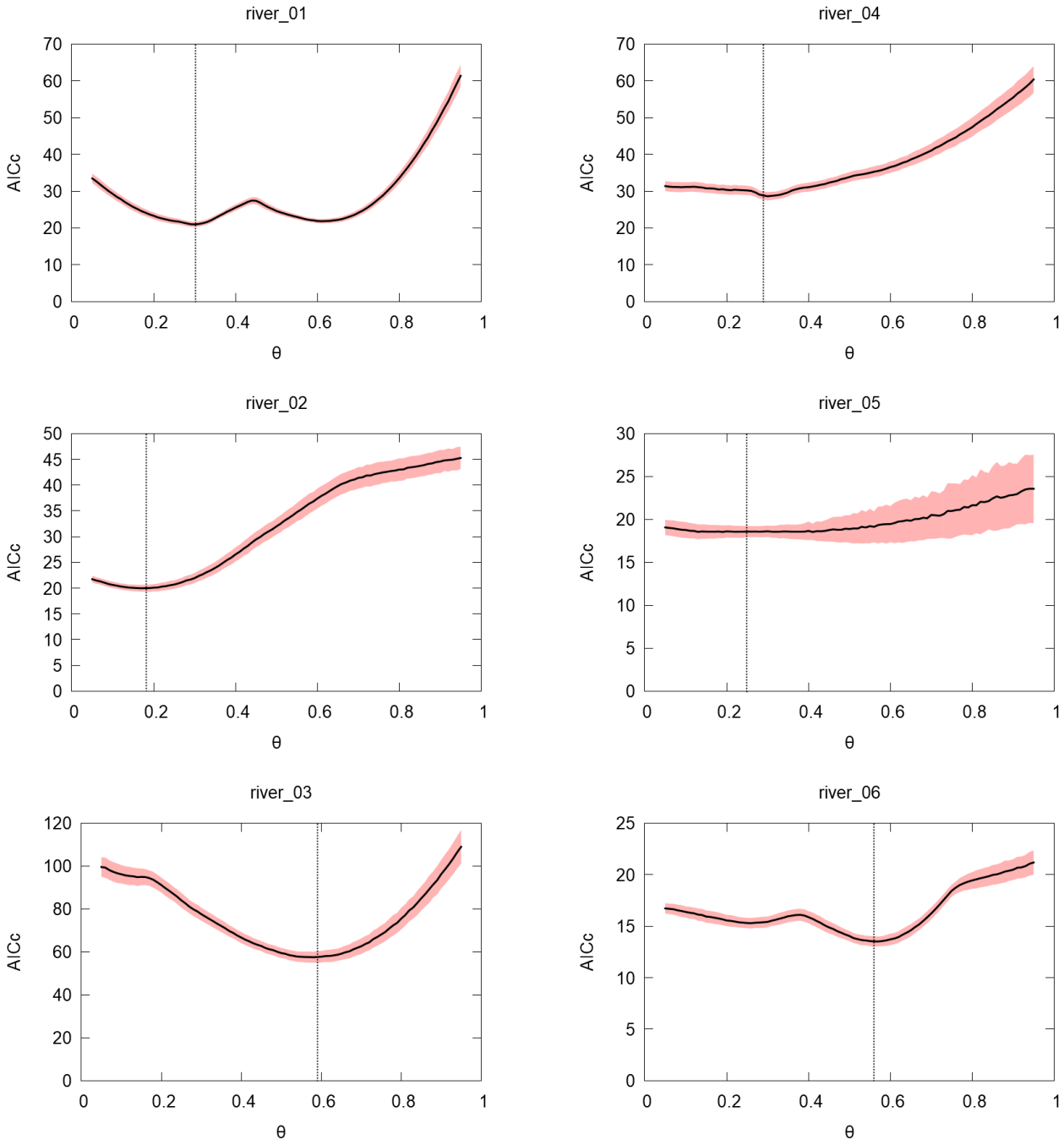

Figure S8: AICc values for each target river. The solid line and shaded red area indicate the mean and ±1σ (standard deviation) interval for 1,000 bootstrap trials.

S4: Comparison of k_{sn} and k_{sn}_χ

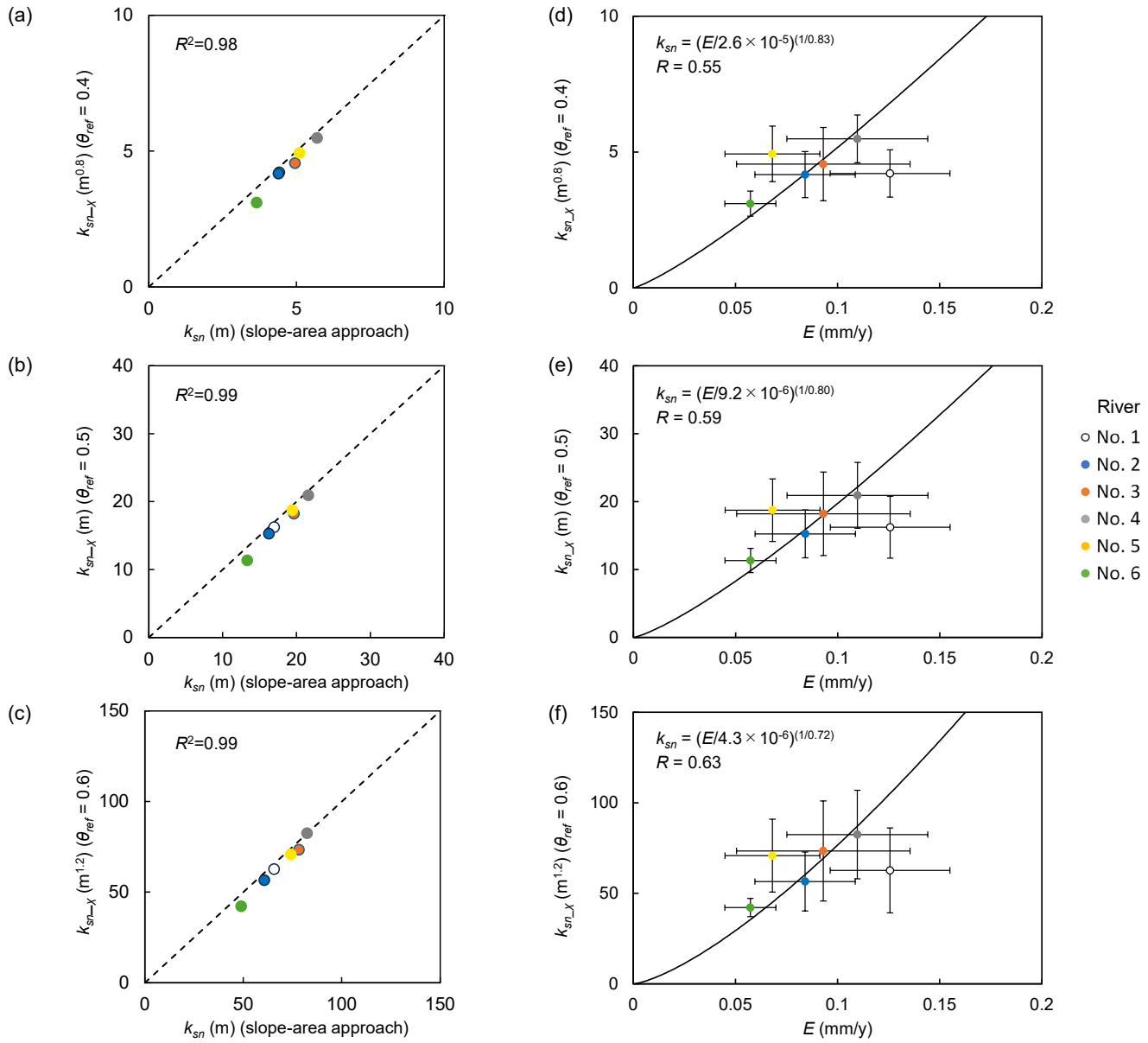

Figure S9: (a-c) Comparison of k_{sn} and k_{sn}_χ and (d-f) channel-averaged river incision rate versus k_{sn}_χ within the detachment-limited reaches for θ_{ref} = 0.4, 0.5, and 0.6. Error bars denote ±1σ. The uncertainty σ for k_{sn}_χ was calculated as $\sqrt{{\sigma_{fit}}^2 + {\sigma_{between}}^2}$, where ${\sigma_{fit}}^2 = \sum_i (w_i\sigma_i)^2/(\sum_i w_i)^2$ (w_i: the weight for stream length for segment i, σ_i : the standard deviation for the slope of the χ plot regression line for segment i) and ${\sigma_{between}}^2 = \sum_i w_i\left(k_{sn\_\chi} - {k_{sn\_\chi}}^i\right)^2/\sum_i w_i$ (${k_{sn\_\chi}}^i$: k_{sn_χ} for segment i). Note that σ_{fit} was several orders of magnitude smaller than $\sigma_{between}$.