Supporting Information for

Power-Law between the Apparent Drainage Density and Pruning Area

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Introduction

In this supporting information, we present total three figures supporting the NHDPlusV2 data analysis and the empirical topographic analyses for the four study river networks in the USA (the Molalla River, the Racoon Creek, the St. Regis River, and the White River). Figure S1 depicts the distribution of source area values provided in NHDPlusV2. Figure S2 shows the semi-log linear trends over stream-orders for the number of streams, the mean length, the mean drainage area, and the mean eigenarea, resulting the associated Horton's ratios. Figure S3 shows the power law relationship *between upstream length and its corresponding upslope area along the mainstream (i.e., Hack's law)*.

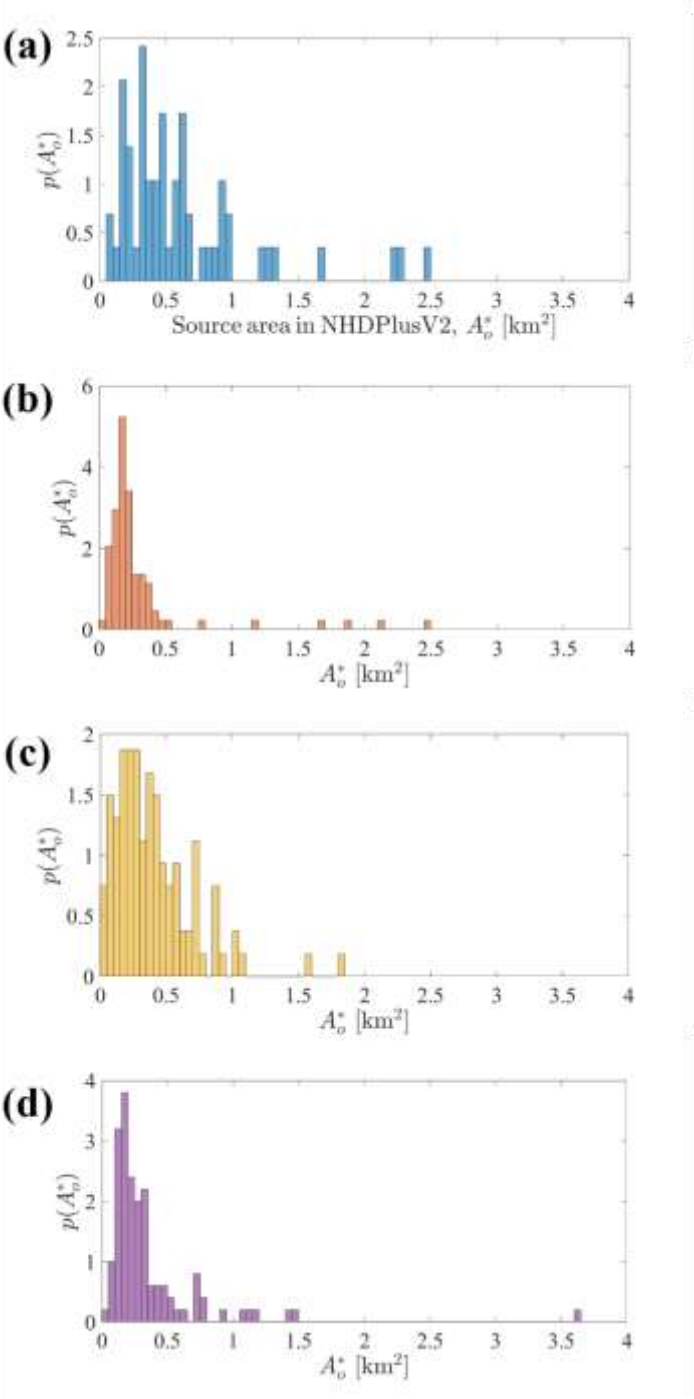

Figure S1. *Probability density function generated from source area values at every channel head in NHDPlusV2 dataset A_o* for (a) the Molalla River, (b) the Racoon Creek, (c) the St. Regis River, and (d) the White River. Each of median value was assigned as a channel forming area A_o to delineate respective river networks (Table 1 in the main text).*

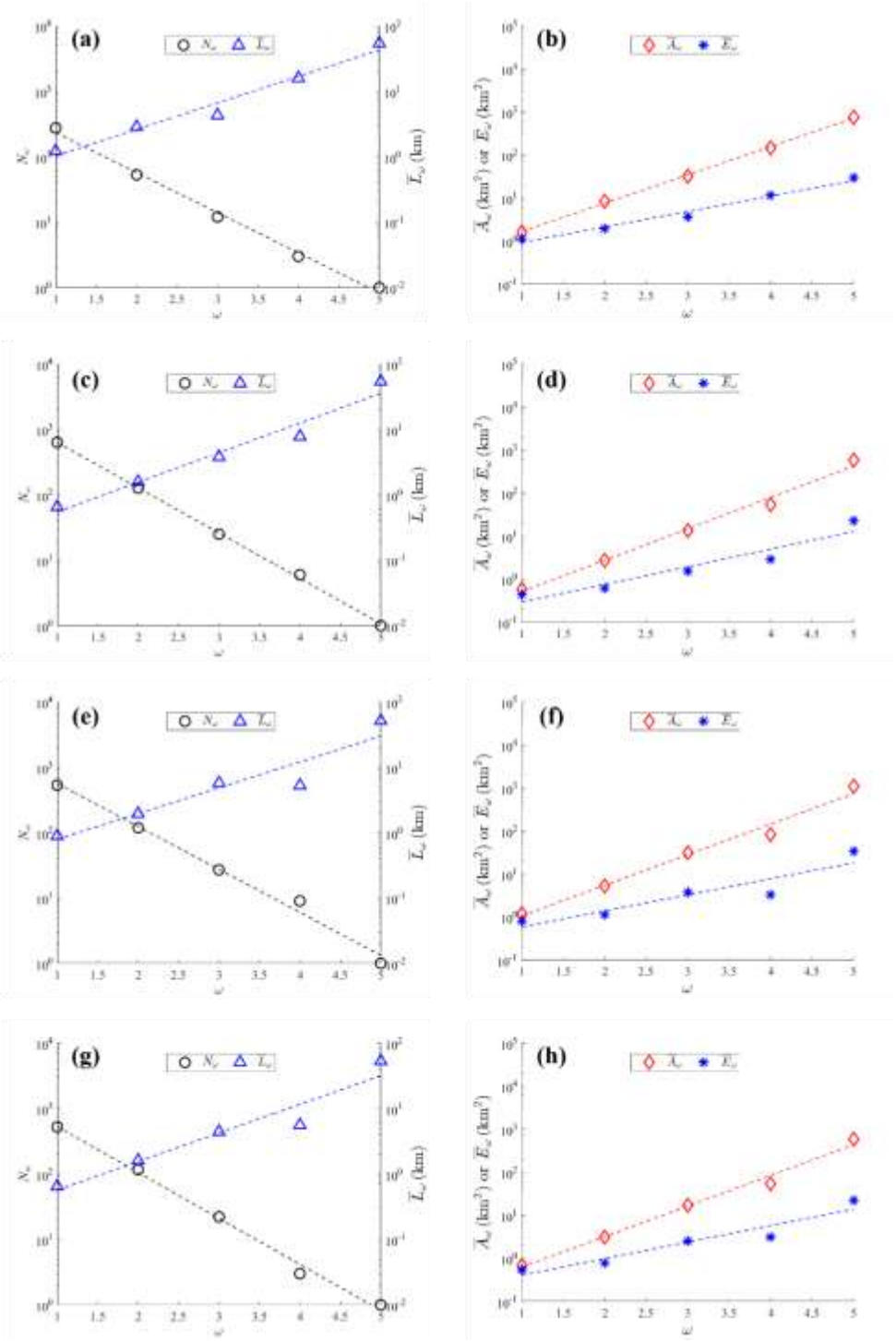

Figure S2. *Variations of the number of streams and the averaged stream lengths (first column), and those of the mean upslope areas and eigenareas (second column) are shown across stream order ω ($1 \leq \omega \leq \Omega$) for (a-b) the Molalla River, (c-d) the Racoon Creek, (e-f) the St. Regis River, and (g-h) the White River.*

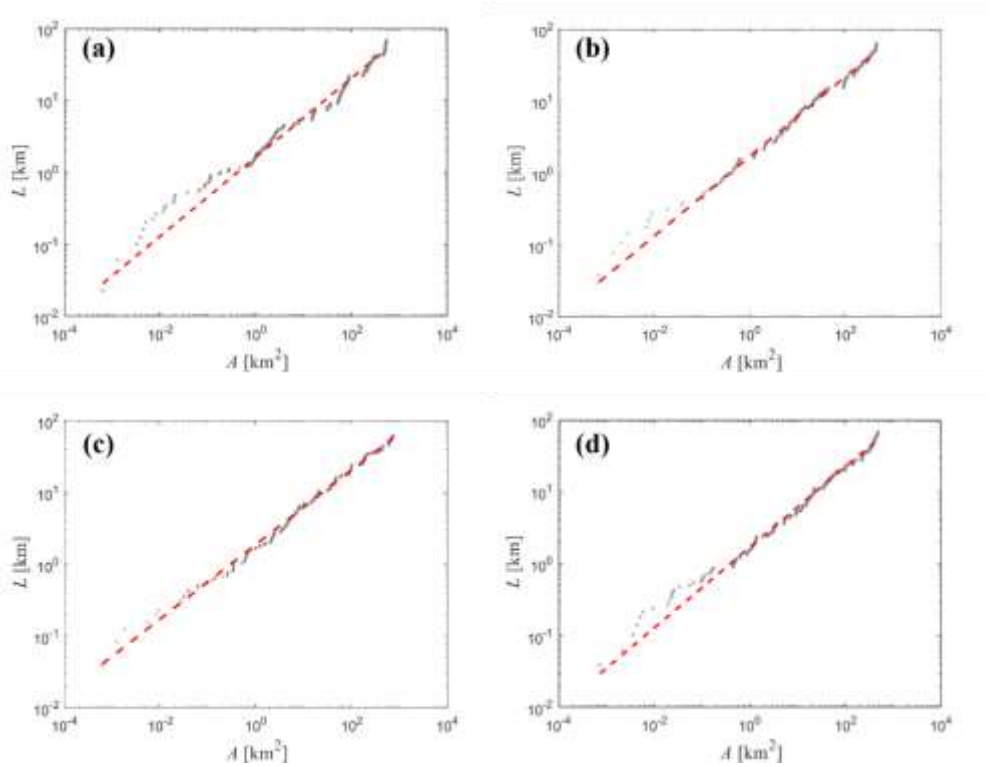

Figure S3. *Relationship between upstream length L and its corresponding upslope area A along the mainstream is shown for (a) the Molalla River, (b) the Racoon Creek, (c) the St. Regis River, and (d) the White River. Grey dots and red dashed lines indicate each variable data and the power law fitting, respectively.*