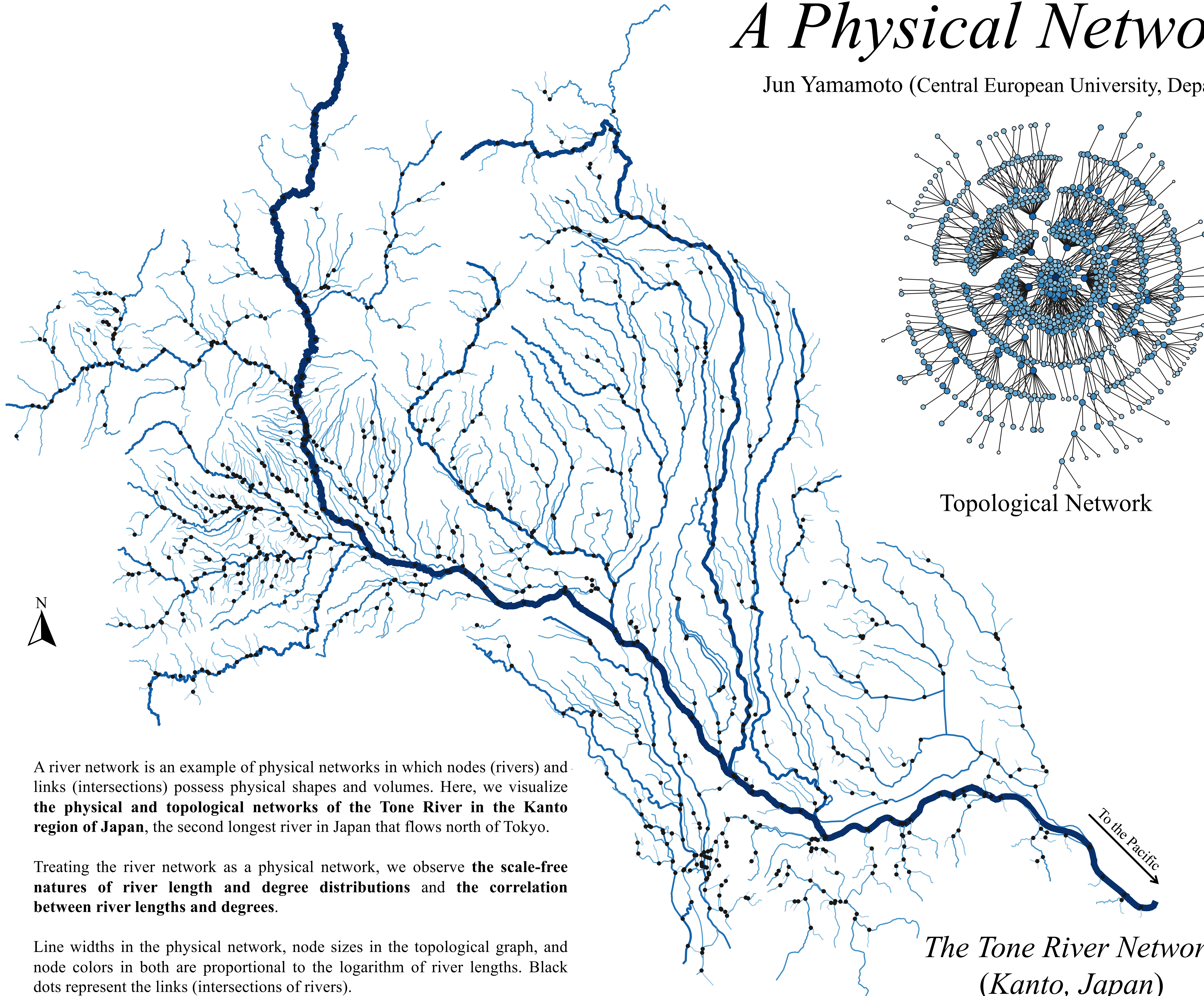


# *A Physical Network of Rivers*

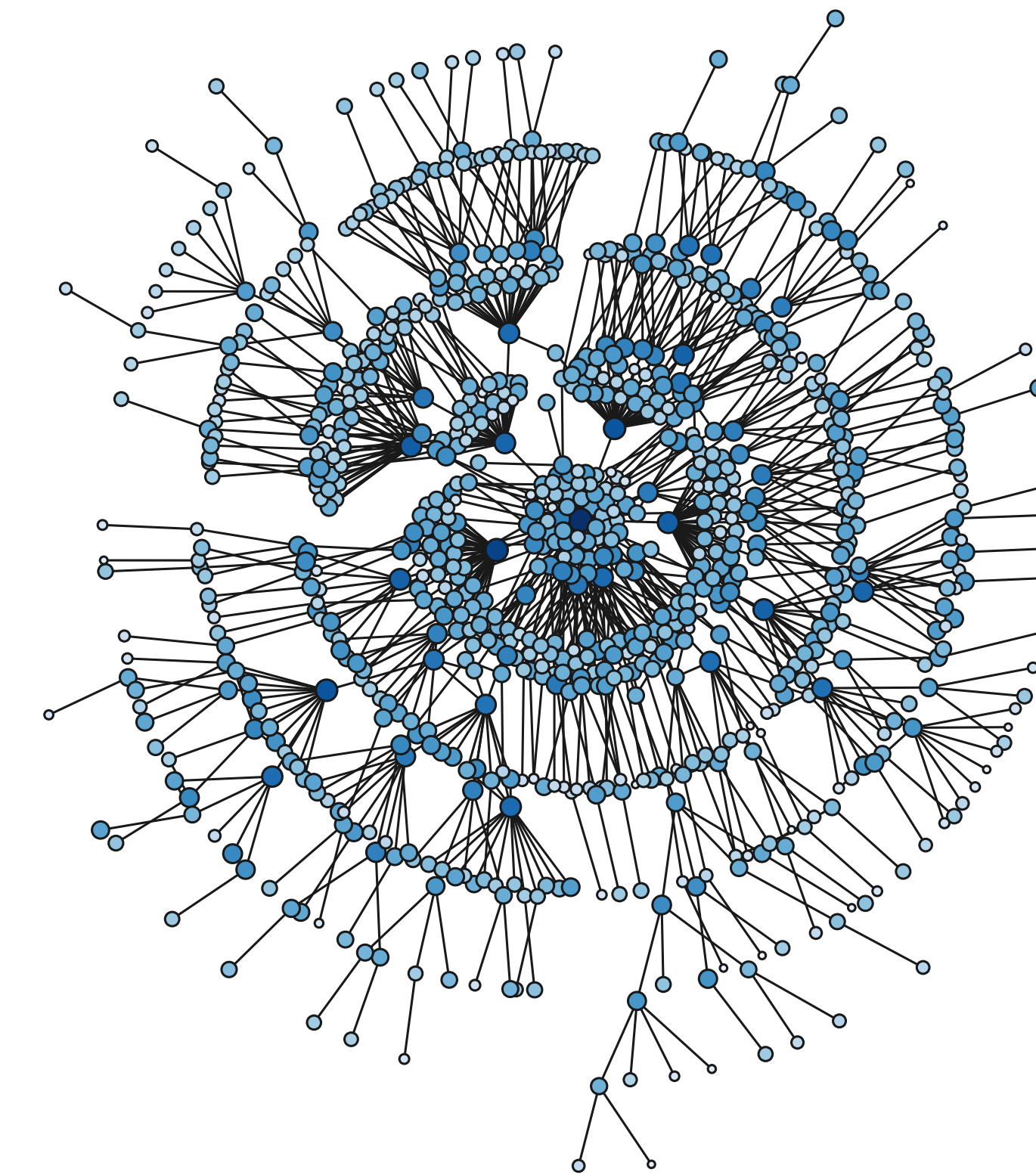
Jun Yamamoto (Central European University, Department of Network and Data Science)



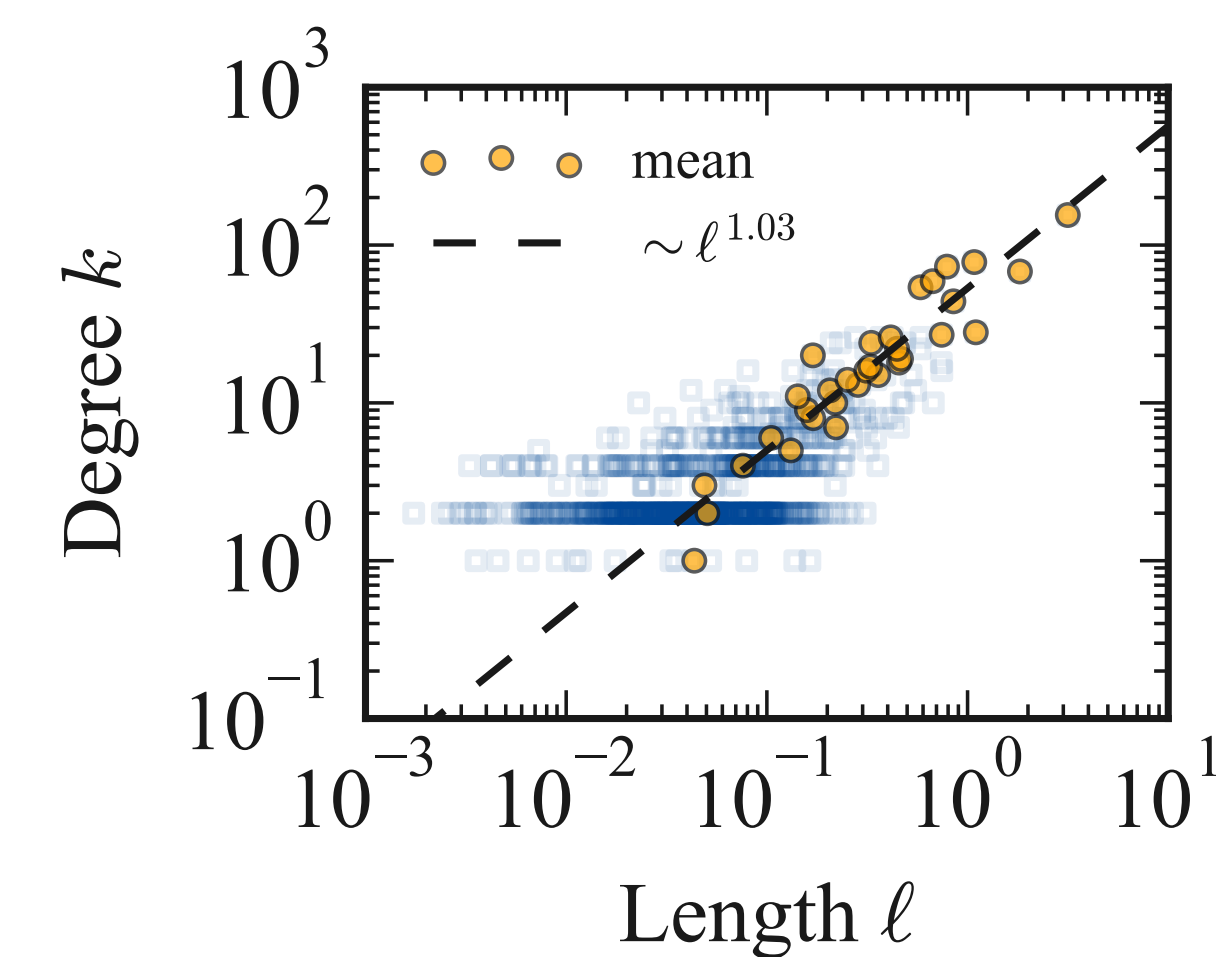
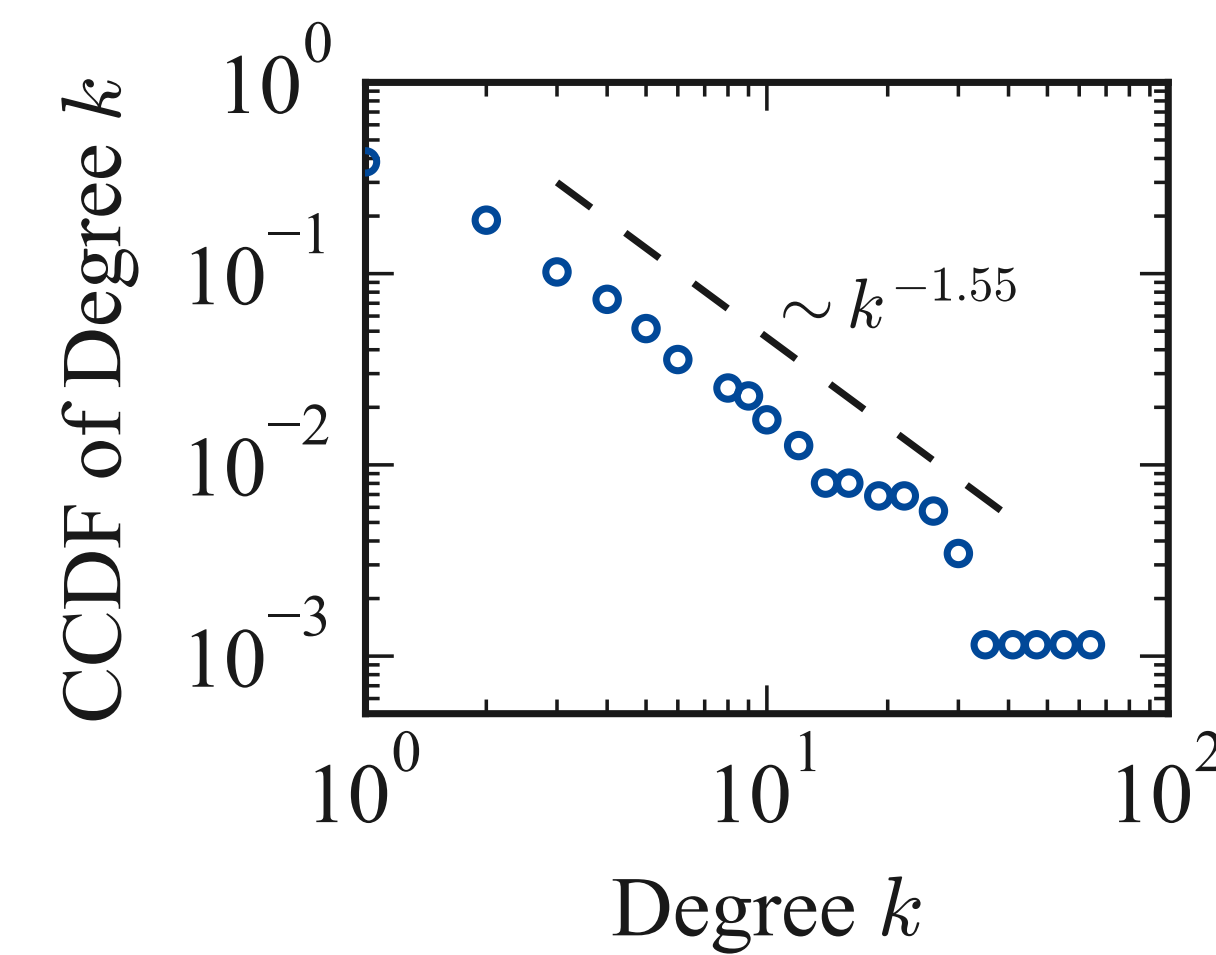
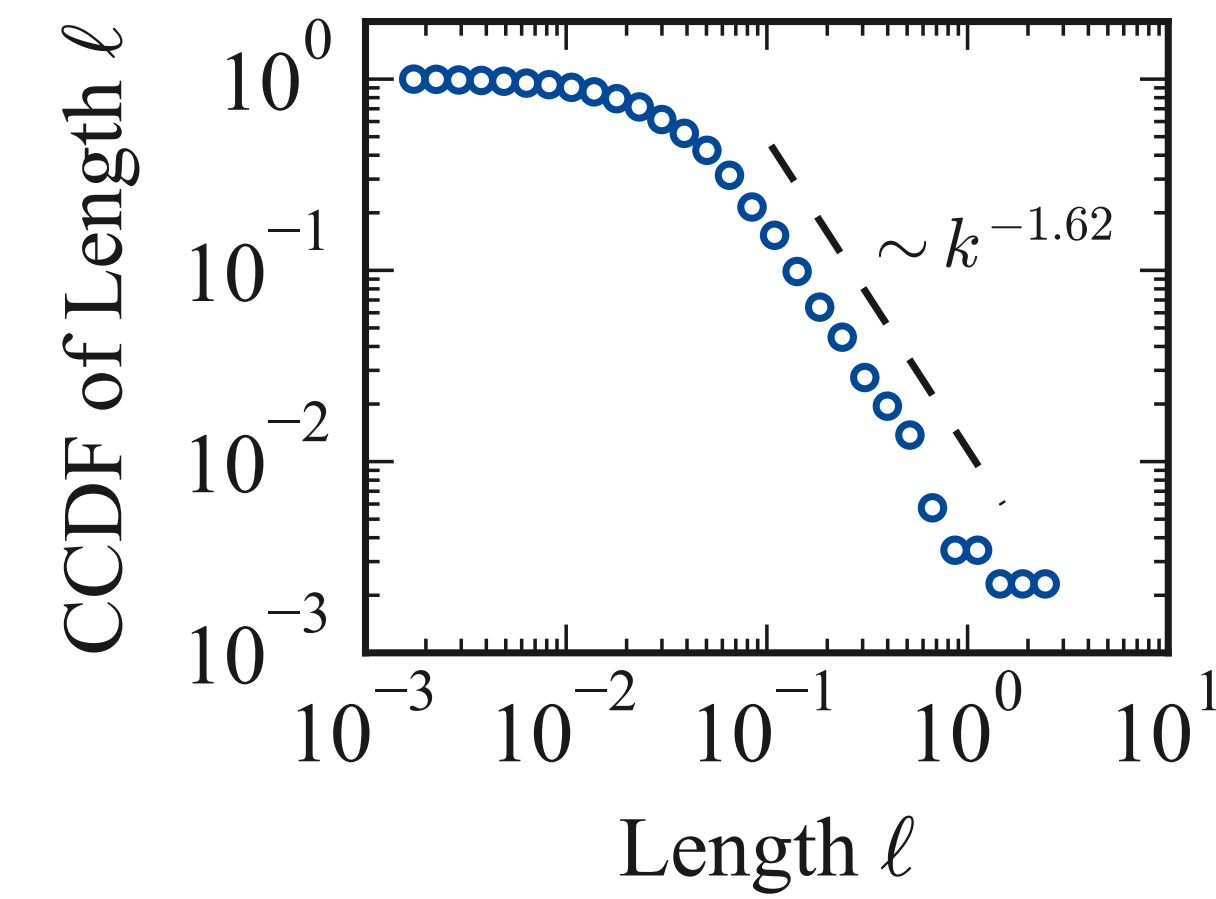
A river network is an example of physical networks in which nodes (rivers) and links (intersections) possess physical shapes and volumes. Here, we visualize **the physical and topological networks of the Tone River in the Kanto region of Japan**, the second longest river in Japan that flows north of Tokyo.

Treating the river network as a physical network, we observe **the scale-free natures of river length and degree distributions and the correlation between river lengths and degrees**.

Line widths in the physical network, node sizes in the topological graph, and node colors in both are proportional to the logarithm of river lengths. Black dots represent the links (intersections of rivers).



Topological Network



*The Tone River Network  
(Kanto, Japan)*