



## Different Responses of Bacterial and Archaeal Communities in River Sediments to Water Diversion and Seasonal Changes

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1.1. $\alpha$ -. Diversity of Bacteria and Archaea

The rarefaction curve of Sobs, Shannon and Coverage diversity indexes gradually became smooth with the increase of sequencing depth (Figure S1). The sequencing depth is 30,000. At such depth, the Sobs, Shannon and Coverage diversity indexes for the observed OTUs was stable, indicating that the sequencing data volume was large enough to reflect microbial diversity information in the samples.



Figure 2. Shannon (a) and Sobs (b) index line graphs for bacteria and archaea.

The number of bacteria showed a pattern of rising and then falling by water transfer, while the number of archaea has been slowly declining. The number of bacterial OTUs fluctuate more in the summer, while that of archaea fluctuate more in the winter.

## 1.2. Evolution of Bacteria and Archaea



**Figure 3.** Evolutionary relationship of bacteria (a) and archaea (b). The color of the tree branches represents the phylum to which the bacteria or archaea belong.

Similarities and differences between species are quantified and visualized by distance. The shorter the distance the closer the affinity between species.