



**Fig. S3.** Pairwise functional comparison among marine, freshwater and terrestrial genomes using 22 gene categories based on KEGG annotation. Gene categories colored in light blue, light pink, turquoise and spring green denote metabolism, genetic information processing, environmental information processing and cellular processes, respectively. Bar charts represent total number of counted genes for each gene category in statistical tests. The enrichment or depletion of each gene category based on two-sided t-test results is illustrated by heat maps. Blank cells indicate there is no significant difference between genomes corresponding to two habitats. Colored cells indicate significant more genes in genomes of one habitat compared to another (Pvalue <0.05). It should be noted that some high estimate values (dark color cells) estimated from categories of few genes were more likely subjected to be overestimated.