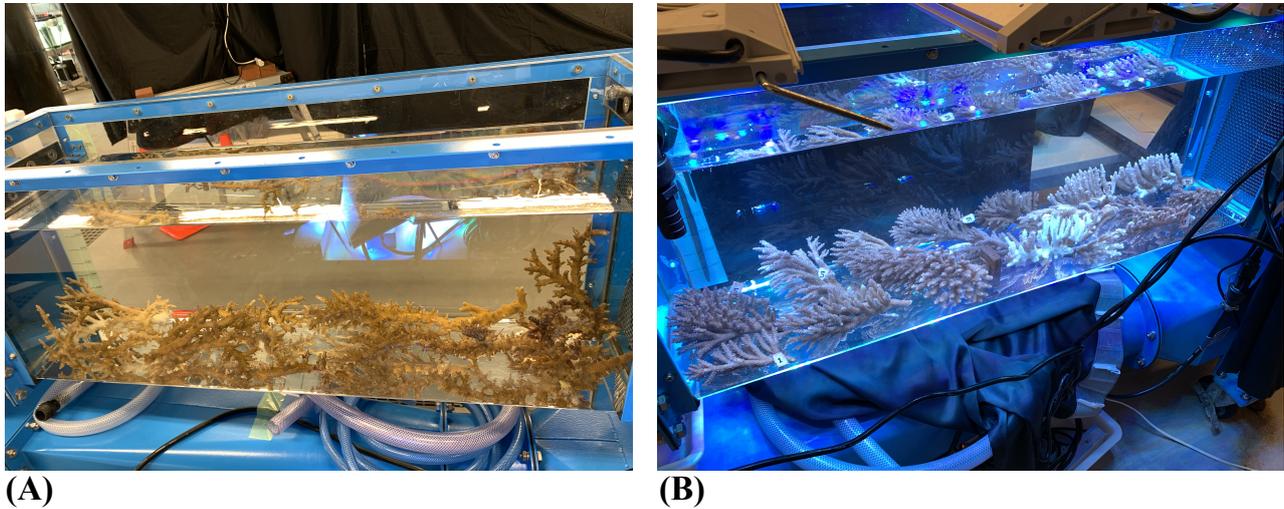
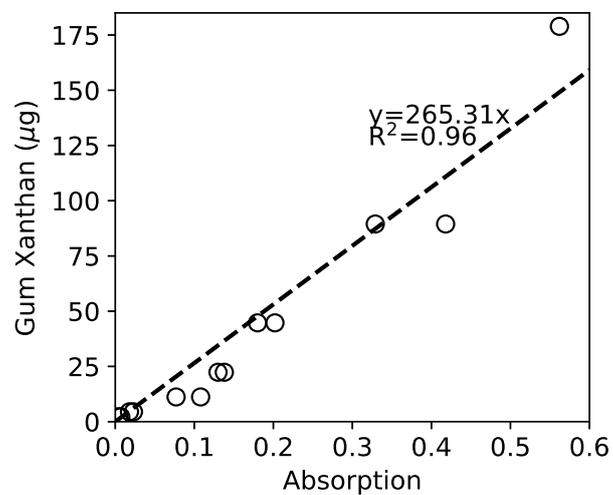


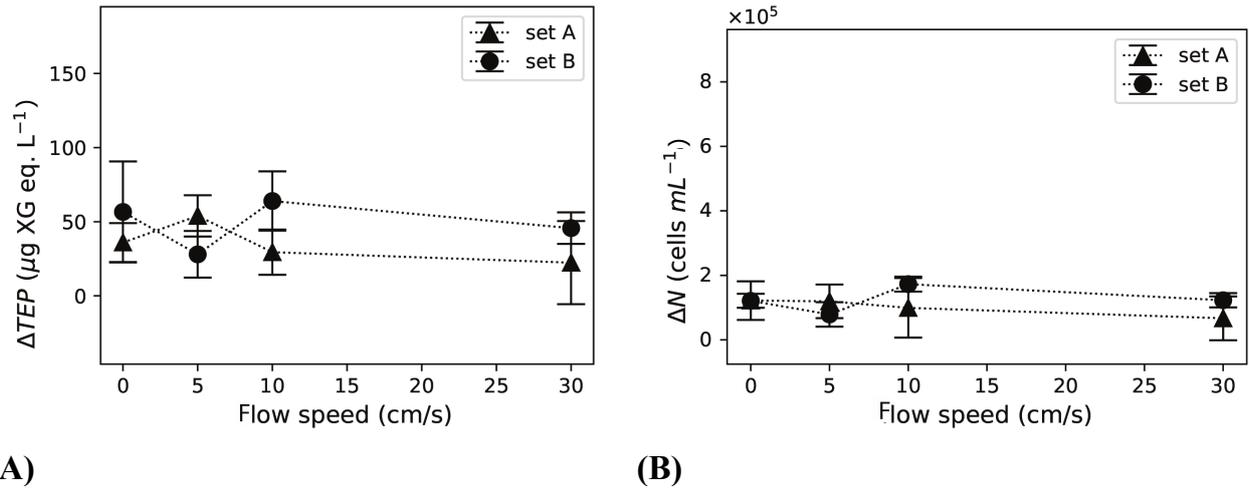
## Supplementary Material



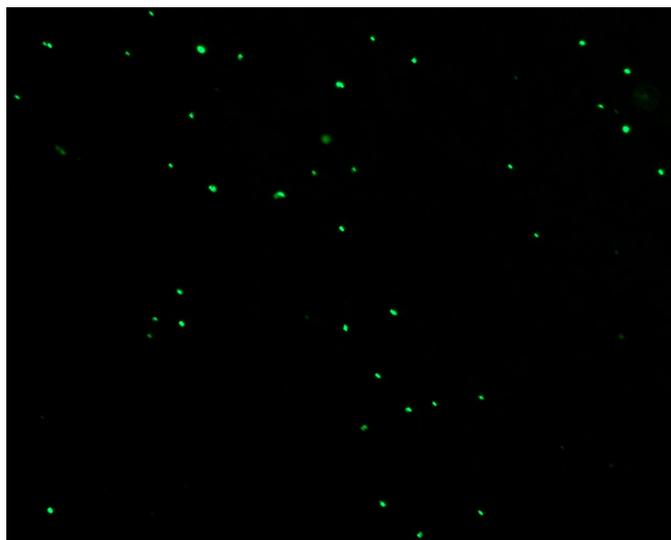
**Figure S1.** Pictures of (A) coral set A (B) coral set B, placed in the flume. The bleaching phenomenon of corals was only confirmed after the no-flow experiments, and no obvious changes in the coral condition were observed before any experiment.



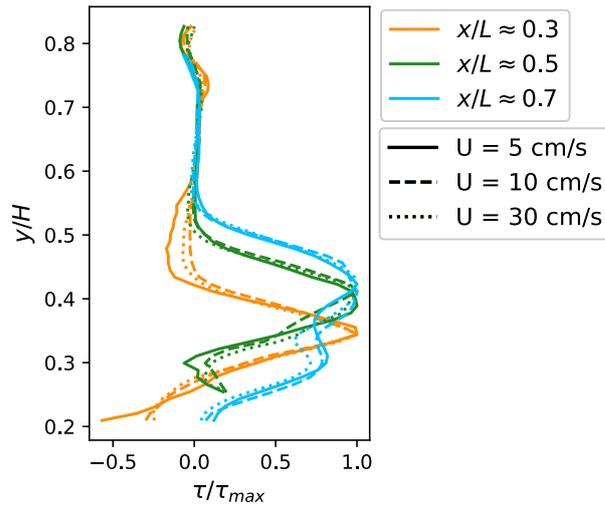
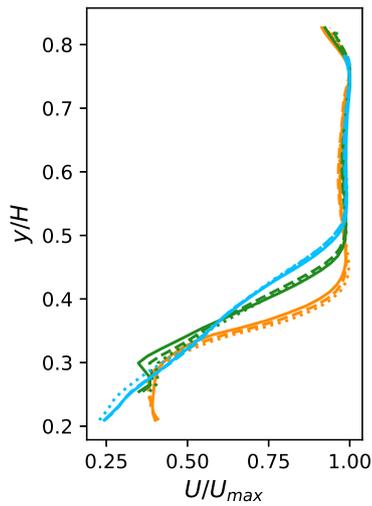
**Figure S2.** The calibration curve for transparent exopolymer particles (TEP) standardizing the TEP concentration with acidic polysaccharide Gum Xanthan. The dash line shows the linear regression line.



**Figure S3.** In the control experiments, the change in (A) TEP concentration,  $\Delta TEP_c$ , and (B) bacterial concentration,  $\Delta N_c$ , did not show substantial difference among different flow speeds.

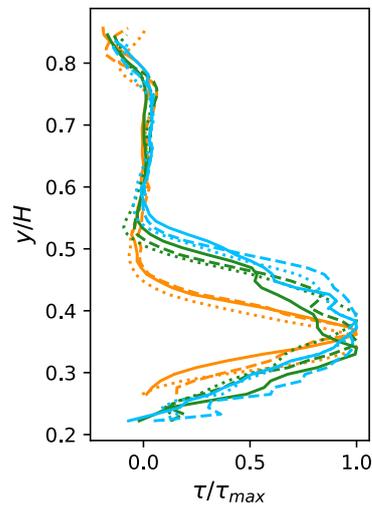
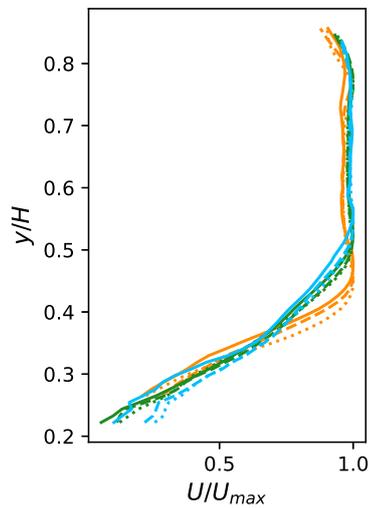


**Figure S4.** A sample of bacterial cells picture for estimating the bacterial abundance.



**Figure 5a.**

**Figure 5b.**



**Figure 5c.**

**Figure 5d.**

**Figure 5.** (A, C) Normalized mean streamwise velocity profiles averaged over lateral slices for (A) coral set A and (C) coral set B. (B, D) Normalized Reynolds shear stress profiles averaged over lateral slices for (B) coral set A and (D) coral set B. The profiles were measured at three streamwise locations in the flume. The vertical distance from the bottom of the test section,  $y$ , was normalized with water depth,  $H$ . The streamwise location,  $x$ , was normalized with the length of the test section,  $L$ . Mean velocity profiles were normalized with the maximum velocity. Reynolds shear stress profiles were normalized with the maximum value in the profile.