

**FIGURE S1 |** Checkerboard plot indicating sites sampled during study period in the Xiangxi Bay of Three Gorges Reservoir (gray squares).



**FIGURE S2 |** Step-by-step procedure for FlowCAM based zooplankton samples processing. In step 1, field sampling, 20 L (V1, L) water was filtered by the plankton net (mesh size 60 µm), then the zooplankton sample was preserved in the bottle with a final volume of 40 ml (V2, ml) for further analysis. In step 2, the zooplankton sample was scanned by the FlowCAM and the particles in the sample were captured and recorded automatically by the FlowCAM system (see captured images for an example); the size attributes (e.g. equivalent spherical diameter, ESD) for each particles was measured by the system automatically; the volume imaged by the FlowCAM (V3) was also recorded by the system. In step 3, all captured particles in the FlowCAM images were classified into rotifer, protozoan, cladoceran, copepod, zooplankton egg, and non-zooplankton particle by the taxonomic expert manually; then, the FlowCAM system can count the particle number (n) for each group. Note that, the ESD of an irregularly shaped object is the [diameter](https://en.wikipedia.org/wiki/Diameter) of a [sphere](https://en.wikipedia.org/wiki/Sphere) of equivalent [volume](https://en.wikipedia.org/wiki/Volume). Details could be found in (Jennings and Parslow, 1988).

**Abundance calculation:**

The zooplankton abundance (ind./L) is calculated as:

**Biomass calculation:**

The biovolume for each zooplankton individual was estimated based on the equivalent spherical diameter (ESD) as: . This is a widely accepted method in zooplankton biovolume estimation (Kimmel et al., 2006; Yamaguchi et al., 2014; Toruan et al., 2021).

**Related literatures:**

Jennings, B. R., and Parslow, K. (1988). Particle-Size Measurement - the Equivalent Spherical Diameter. *Proc. R. Soc. A-Math. Phys. Eng. Sci., 419*(1856), 137-149. doi:10.1098/rspa.1988.0100

Kimmel, D. G., Roman, M. R., and Zhang, X. S. (2006). Spatial and temporal variability in factors affecting mesozooplankton dynamics in Chesapeake Bay: Evidence from biomass size spectra. *Limnol. Oceanogr., 51*(1), 131-141. doi:10.4319/lo.2006.51.1.0131

Toruan, R. L., Coggins, L. X., and Ghadouani, A. (2021). Response of Zooplankton Size Structure to Multiple Stressors in Urban Lakes. *Water, 13*(16). doi:10.3390/w13162305

Yamaguchi, A., Matsuno, K., Abe, Y., Arima, D., and Ohgi, K. (2014). Seasonal changes in zooplankton abundance, biomass, size structure and dominant copepods in the Oyashio region analysed by an optical plankton counter. *Deep-Sea Res. Part I-Oceanogr. Res. Pap., 91*, 115-124. doi:10.1016/j.dsr.2014.06.003



**FIGURE S3 |** Detail plots of the size spectrum estimations for all samples. Sampling date and sampling site marked in the left bottom of each subplot, b value marked in the upper-right corner of each subplot.