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Effects of three floating treatment wetland arrangements on the flow field of a channel

Taís Yamasaki¹ and Johannes Janzen²

¹Federal University of Mato Grosso do Sul, Campo Grande, Brazil (taisnatsumi@gmail.com)

²Federal University of Mato Grosso do Sul, Campo Grande, Brazil (johannesjanzen@gmail.com)

Floating treatment wetlands (FTWs) constitute a nature-based solution that promotes water, stormwater and wastewater treatment by using vegetation growing hydroponically on top of a floating mat. One of the advantages of FTWs is not requiring land space to install them, since FTWs are put directly on the water body's surface. Consequently, FTWs can have the potential to affect the flow field, inducing preferential paths and short-circuit, for instance, which may be controlled by how the FTWs are arranged on the water surface. This study aims to numerically simulate the flow field for three FTW arrangements displayed in a channel reach, in order to assess the hydrodynamic differences between each arrangement. In Arrangement 1, three FTWs in series will be installed at the channel center. Arrangement 2 will be formed by three FTWs in series, each one spanning the channel width. Finally, Arrangement 3 will be formed by two FTWs displayed at each margin of the channel. The total FTW volume will remain constant for all arrangements. The simulations will be performed in Computational Fluid Dynamics (CFD), using a validated FTW model from laboratory experiments.