XI International Conference on Computational Methods in Marine Engineering

Drag Loads to Aquaculture Nets and the Corresponding Flow Velocity Reduction behind

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ABSTRACT

Drag loads to aquaculture nets are largely determined by the net solidity. Recent years the methodology for measurements of solidity has been more settled with photographical determination of solidity being the preferred method as described in NS 9415 (2021). The amount of empirical data for drag loads to nets have increased, (e.g Føre et al 2022). This has given the possibility for a revisit to the load formulation for drag loads to net membranes in AquaSim (Aquastructures 2013) which is based on Berstad et al (2012).

Recent years, wind turbine calculations have been introduced to AquaSim (Aquastructures 2024) based on the BEM method (e.g Hansen 2008). This is based on 1D momentum theory which describes flow through a porous section. The paper presents how 1D momentum theory is combined with the drag formulation from Berstad et al (2012) to update the expression for drag to nets. The momentum theory also leads to an expression for flow reduction behind nets which is an update of the current calculation of flow reduction based on Løland (1991).

Comparison to empirical data is carried out and results are discussed.

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