

The modeling of the towing and hauling back phases of a Scottish seiner.

Scottish seine is a fishing technique used for demersal fish. This fishing method depends on using long lengths of wire up to 3.5 km per side, to herd fish into the path of a trawl as the gear is hauled slowly back. In the present paper, the modeling of the technique and a comparison with experimental data are presented. The modeling is founded on the finite element method (FEM) model of the net based on a triangular element. The FEM model takes into account the tension in twines and cables, the drag force on the net and cables due to the towing, the floatability and weight of the net and cables, the friction of the cables on the bottom due also to the towing. To model the reduction of length of warp due to the hauling phase, bar elements which constitute the warp are reduced one by one by decreasing their unstretched length. This reduction is time dependant and is defined in a table built by the user. The forces taken into account in the model are the tensions on the twines and cables, the drag on the netting and cables, and the friction on the bottom. The acceleration force (inertia) is also accounted for. From these forces, the Newton-Raphson iterative method gives the equilibrium position of the net and cables. A comparison with experimental data has been carried out.