



Semi-Markov model for the inference of the trajectories of fishing boats: application to the VMS data of the French and pelagic tuna fleet of the ZEEM

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Abstract

Analysis of VMS data could provide a reliable alternative for conducting pelagic stock assessments. For example, the fisheries community has been preparing GPS data for fishing vessels for some years. For the most part, the methods developed here are based on Markovian or semi-Markovian hierarchical models. This allowed us to show the informative potential of the VMS data. Once trajectories have been interpreted, these trajectories can be used to fine-tune fishing activities, as well as fish research activities when these phases are important for the trades concerned (large and small pelagics, for example). In this work, two semi-Markov models hidden to three and then five states were set up and validated using observational data to model the trajectories of tuna vessels in the Atlantic and Indian Oceans. These models yielded an estimate of the actual fishing effort deployed by the fleets concerned.



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