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**PhD project: Accounting for current challenges in commercial fish stock assessment models: it is worth increasing the complexity?**

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**Summary:** Currently, commercial fish stock assessment models include among their objectives the evaluation of different management measures (quotas, effort reduction, etc.). To meet these requirements, stock assessment models have evolved from simpler methods (e.g. stochastic surplus production model in continuous time, SPiCT or length-based indicators, LBI) to more complex or integrated models (e.g. state-space assessment model, SAM or stock synthesis, SS). With these integrated models, a large number of ecological processes can be considered and very specific questions can be answered. However, they also require a larger amount of data, which translates into an increasing economic, statistical and computational effort. This thesis will raise the debate of whether it is worthwhile to increase the complexity of stock assessment models. To explore this hypothesis, three particular cases will be considered: (1) the comparison of a single-sex versus a separate-sex (SS) model for a sexually dimorphic species such as European hake (*Merluccius merluccius*); (2) testing the differences between the configuration of a single-area versus a multiple-area (SS) assessment model for yellowfin tuna (*Thunnus albacares*) and (3), contrasting the performance of these complex models against simpler models and assessing their impact on different management measures.



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