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Assessing sex dimorphic species using Stock Synthesis: the case of the Atlantic southern hake stock

Southern European hake (Merluccius merluccius) is a quite relevant stock in social and economic terms in Iberian waters. Even though there are some knowledge gaps that have complicated the implementation of a data rich model to provide a sound catch advice and it is currently assessed with a data limited model. Due to the need for a new assessment model, it was decided to use Stock Synthesis (SS) (Methot and Wetzel (2013), as it is one of the main models currently used for age- and length-based species (such as the South Atlantic hake stock). As an integrated model, SS allows the input of incomplete trends of data from different sources, such as catch data, catch per unit effort (CPUE) and survey indices. Among the multiple configurations of SS, we can find the alternative of single biology (sex, growth and natural mortality), as established in the previous stock assessment model, or separate sexes. In addition, this model allows to indicate that each stock entity starts to grow in the first month of the year, but also different recruitment peaks can be specified. It is important to mention that i) European hake is a highly dimorphic species as females are considerably larger than males, ii) this stock presents different spawning peaks throughout the year and iii) information on the sex-separated size distribution and hence the sex ratio of the stock has been recently obtained from oceanographic surveys. For these reasons, alternative SS models with various configurations have been tested for this species. Results are presented and discussed together in order to find the best alternative for the assessment of this stock.