Session 02

Climate-driven shift of *Sardinella aurita* stock in Northwest Africa ecosystem as evidenced by robust spatial indicators

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Abstract

In Northwest Africa, the small pelagic fish are in abundance and play a crucial role for the food safety of populations. The pelagic resources are exploited both by small-scale artisanal and industrial fleets. The landing structure of the countries in the region has been in perpetual change during the last years. The sardinella has been more and more landed by fishermen in Morocco**,** while the sardine has become a target by fishing vessels in Mauritania and Senegal. This indicates a modification in the distribution areas of pelagic resources. To verify this hypothesis, an outstanding database consisting in 14 acoustic surveys with a consistent and high sampling intensity (2263 trawl hauls) conducted by the RV Fridtjof Nansen from 1995 to 2015 was investigated in this study to identify trends in distribution shifts in pelagic fishes. A focus was made on sardinellas and the main species in the southern part of the region. Two strong spatial indicators are used in this study: the latitudinal extreme location and the barycentre of biomasses. Two clear trends can be observed from the data analysed. Firstly, in the southern and tropical part of this system the typical trend is that pelagic species show an increasing northward distribution. This applies to *S. aurita*, *Trachurus trecae*, *Chloroscombrus chrysurus, Sphyraena guachancho and Brachydeuterus auritu.* A second group is observed, those that do not show any clear trend in distributional shift, but where the distribution is stable over the period. The typical species observed here are *S. maderensis* and *Decapterus rhonchus.* Despite some variations in the upwelling intensity, we show that the sea surface temperature is by far the main parameter to explain this northern shift. We also discuss the likely – and largely unknown – influence of the under-estimation of the detections because of the absence of sampling in the shallow

coastal zone. The impact of such displacements is also discussed in term of regional management of these shared stocks.

Keywords: small pelagic fish, North West Africa, distribution changes, spatial indicators, sardinellas.

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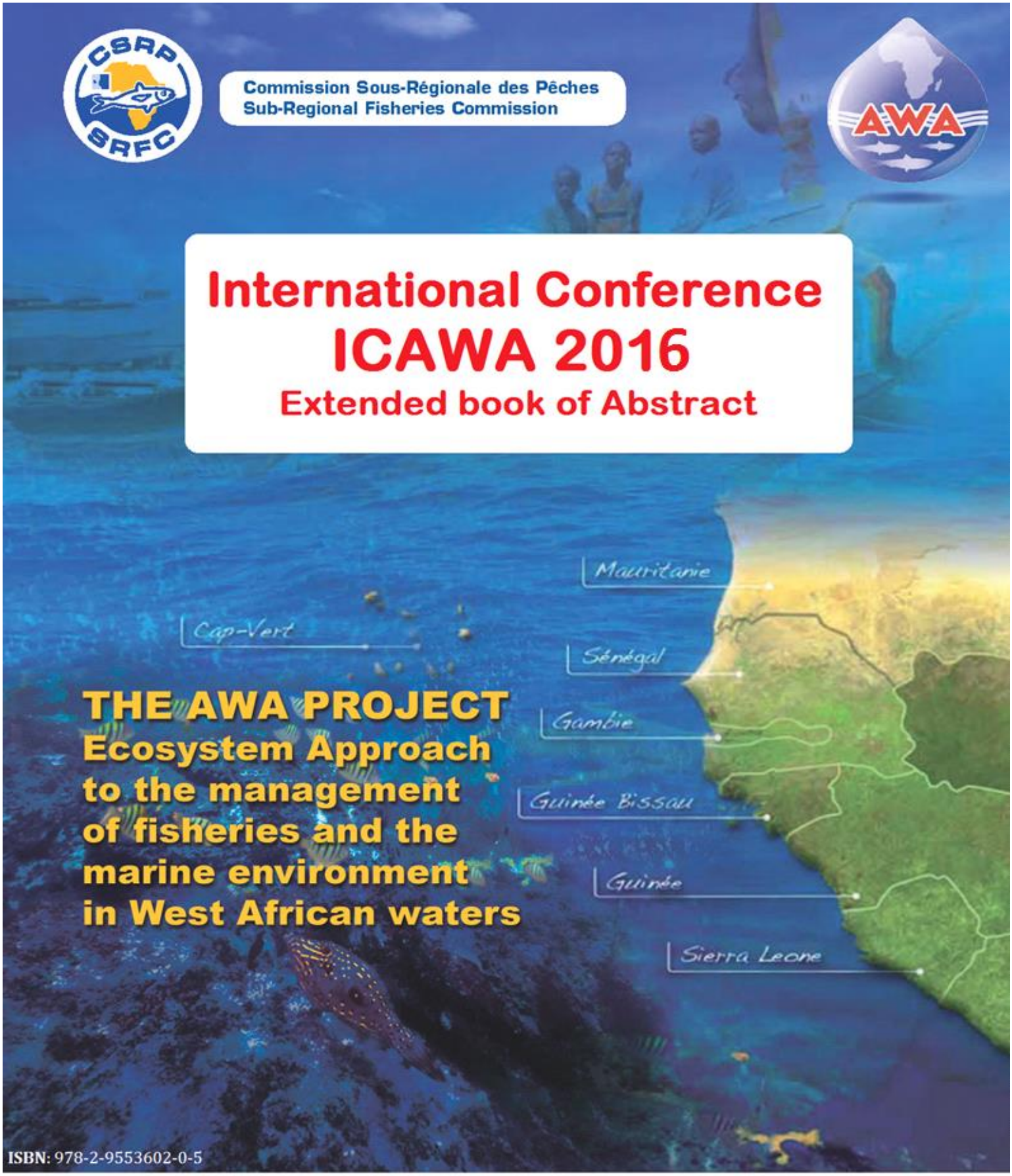

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