Comparative Analysis of Diel Vertical Migration between three Atlantic African Large Marine Ecosystems

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Abstract

Diel vertical migration (DVM) of micronekton is a behavioural mechanism driven by a trade-off between predator avoidance and access to prey. This trade-off is controlled by environmental forcing that can lead to changes of DVM pattern under changing environmental conditions. Time series of hydro acoustic surveys between 1995 – 2015 of three large Atlantic ecosystems (Canary Current - CCLME, Guinea Current - GCLME, and Benguela Current - BCLME) were analysed to calculate DVM patterns based on volume backscattering strength (S_v). DVM related descriptors (n=15) were calculated for areas according to bathymetric definitions (shelf = 10 – 150 m bottom depth, slope = 150 – 500 m bottom depth, and plain > 500 m bottom depth). Typical DVM I pattern, with micronekton descending during daytime and ascending during night-time, were observed on the slope and plain in all three ecosystems, but not on the shelf with only negative day-night values in the CCLME and BCLME. Lower daytime S_v values during the day compared to night-time suggest either less dense patches of micronekton leading to negative day-night differences in the CCLME and GCLME or insufficient measurements of certain depth strata (*e.g.*, 0 – 10 m surface). Only a few significant and different DVM descriptors suggest a change in the CCLME and the GCLME in the last 20 years. All other insignificant descriptors assume natural variability in large Atlantic ecosystems. Our results provide insight into inter-annual variability in micronekton DVM patterns.

Keywords: LME, CCLME, GCLME, BCLME, West Africa, climate change, DVM, fisheries acoustics, pelagic ecosystem.

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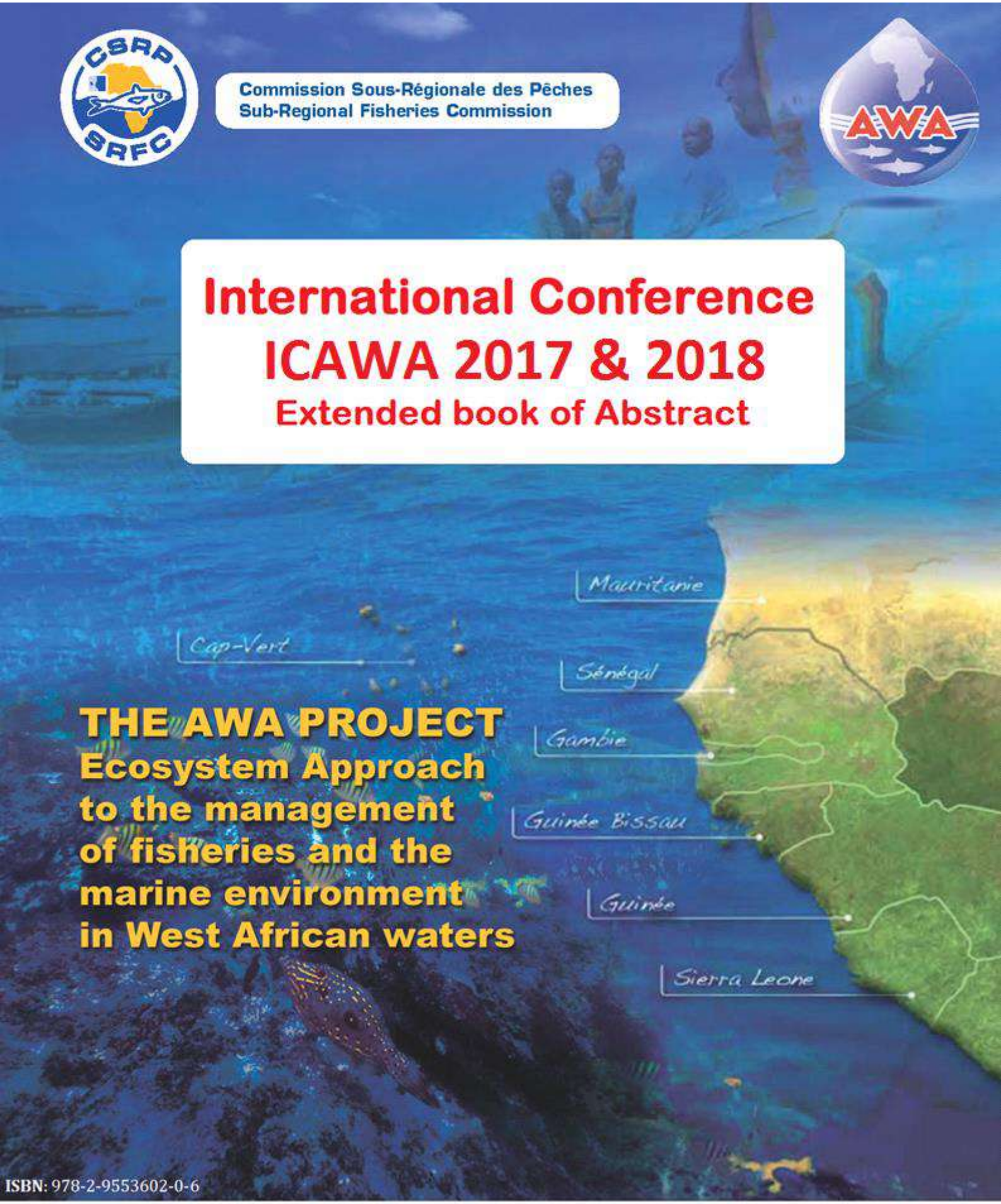
Extended book of Abstract



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