Micronektonic acoustic density variations in Guinea Current Large Marine Ecosystem continental shelf from 1999 to 2006

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Abstract

The Guinea Current Large Marine Ecosystem (GCLME) extends from Bissagos Island (Guinea Bissau) in the north (11°N, 16°W) to Cape Lopez (Gabon) in the south (0°S, 8°E) and includes the study zone, from 4°N, 8°W to 6°N, 3°E. Acoustic data were recorded with a 38 kHz echosounder, from 10 to 500 m depth over 7 surveys, 6 were selected here, totalling 16 618 nmi from 1999 to 2006. To get homogenous data, (i) only off-upwelling season surveys (April to September) were studied and (ii) only continental shelf data were considered (10-150 m). The mean volume backscattering strength (Sv in dB) was used as a micronektonic biomass proxy to assess its spatial inter-annual variability. Diel transition periods were removed from analyses to avoid micronektonic density changes bias due to diel vertical migrations. Data were echointegrated at a spatial resolution of 0,1 nmi*1 m depth using Matecho tool (Perrot et al., 2018). (i) On horizontal dimension, the variability in annual micronektonic densities was assessed using the mean Sv value for each 0,1 nmi Elementary Sample Unit (ESU). (ii) On vertical dimension, the water column variation (%) filled by micronektonic acoustic layer (filling rate) across years was estimated using a linear regression and the change of micronektonic spatial structure between day and night was assessed using the mean Sv value for each 1 m depth step. GCLME have a narrow continental shelf vs. other African Atlantic LMEs. No significant change of micronektonic biomass proxy has been observed from 1999 to 2006 in this study (Fig. 1). As expected, a difference is observed in the vertical micronektonic acoustic density between day and night (Fig. 3). However, there is a paradoxical process, indeed there is an increase in Sv during nighttime. Two hypotheses are proposed: (i) the increase in density could be explained by an offshore horizontal diel migration or (ii) a very high contribution of the micronektonic density occurring in surface (0-10 m) is suspected, which corresponds to the blind zone of the research vessel. According to the new descriptor "water column filling rate", a significant change in the system is reported. Indeed there is an increase in five years.

Future investigations should focus on this interesting phenomenon, which could be link to an effect of global change. We have to take care that such increase could also inform on a major change in the trophic web in this part of the GCLME. These findings can be interpreted as an early warning signal and encourage for future study.

Commission Sous-Régionale des Pêches
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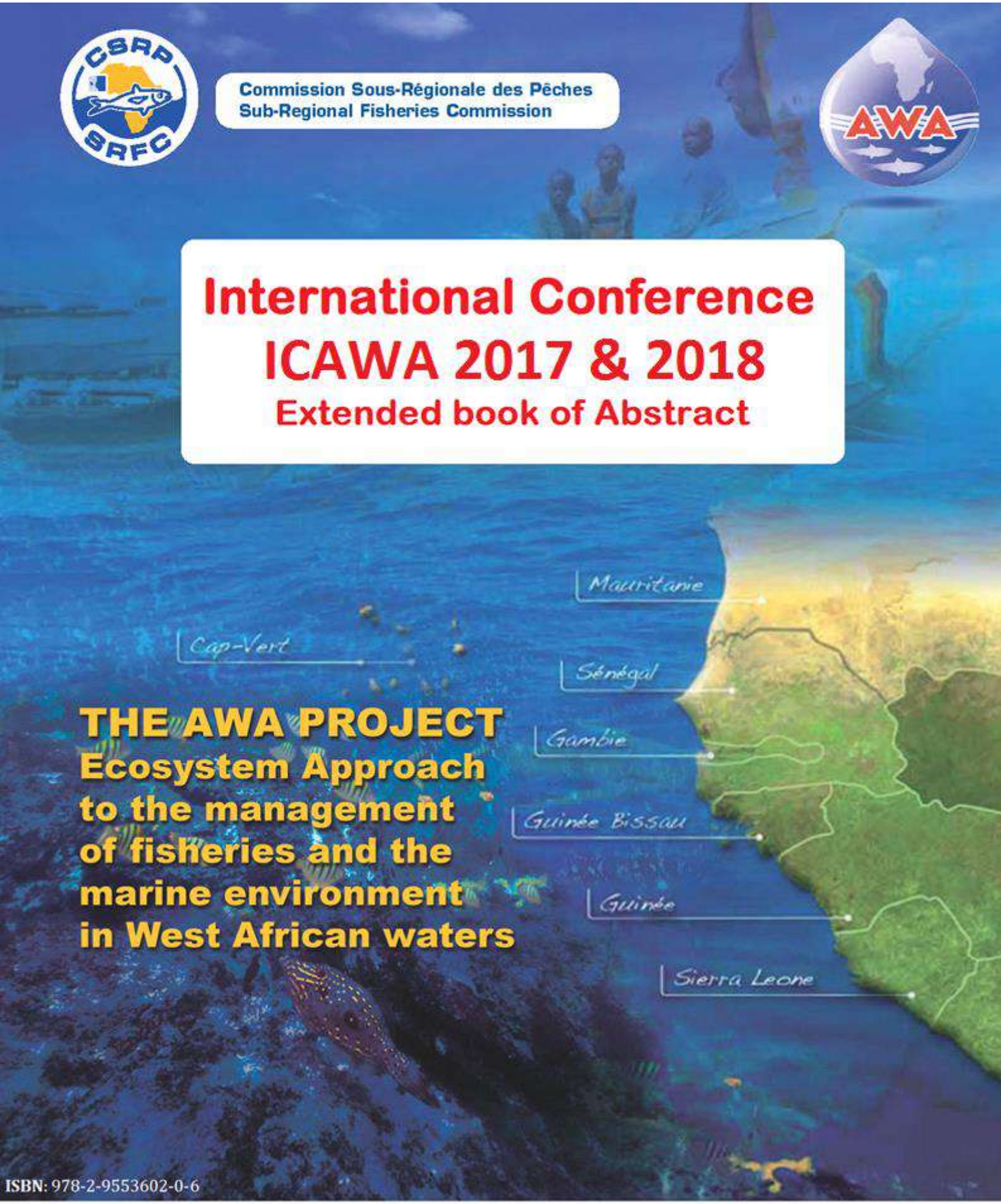
Extended book of Abstract



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The both last ICAWA edition, 2017 and 2018, was done as a joint event with other closely related meeting. In 2017 with the inauguration of the OSCM in Cabo Verde underlining AWA cooperation with INDP and UNICV as well as Geomar and collaborators. In 2018 ICAWA was join to Preface final meeting following the memorandum of understanding signed a couples of years before between the two consortium and which have led at the end to a common policy session followed by the redaction of a policy brief taking advantage of the results of the both projects. Some abstract aside ICAWA joint session are missing see the orgniser to get more information.

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