Micronektonic acoustic density variations along Benguela Current Large Marine Ecosystem continental shelf from 1994 to 2001

Uatjavi UANIVI [1,*], Anne MOUGET [2], Yannick PERROT [2], Nolwenn BEHAGLE [2], Chloé MIGAYROU [2], Abdoulaye SARRÉ [3], Jens-Otto KRAKSTAD [4], Ndague DIOGOUL [5,2,3], Hervé DEMARCQ [6], and Patrice BREHMER [2]

[1]Ministry of Fisheries and Marine Resources (MFMR), P.O. Box 25305 Windhoek / P.O. Box 912 Swakopmund, Namibia
[2]Institut de recherche pour le développement (IRD), UMR Lemar, Campus Ifremer, Délégation régionale IRD ouest France, 29280, Plouzané, France
[3]Institut Sénégalais de Recherche Agricole (ISRA), Centre de Recherche Océanographique de Dakar Thiaroye (CRODT), Pôle de recherche de Hann, Dakar, Sénégal
[4]Institut of Marine Research (IMR), Nordnesgaten 50, 5005 Bergen, Norway
[5]Université Cheikh-Anta-Diop (UCAD), BP5005, Dakar, Sénégal
[6]Institut de recherche pour le développement (IRD), UMR Marbec, Avenue Jean Monnet, 34280, Sète, France

*Correspondance: Tél: (+264) 81 256 0303; Courriel: uatjavi@yahoo.co.uk (U. UANIVI)

Reçu le 01/04/2018; publié le 15/06/2019

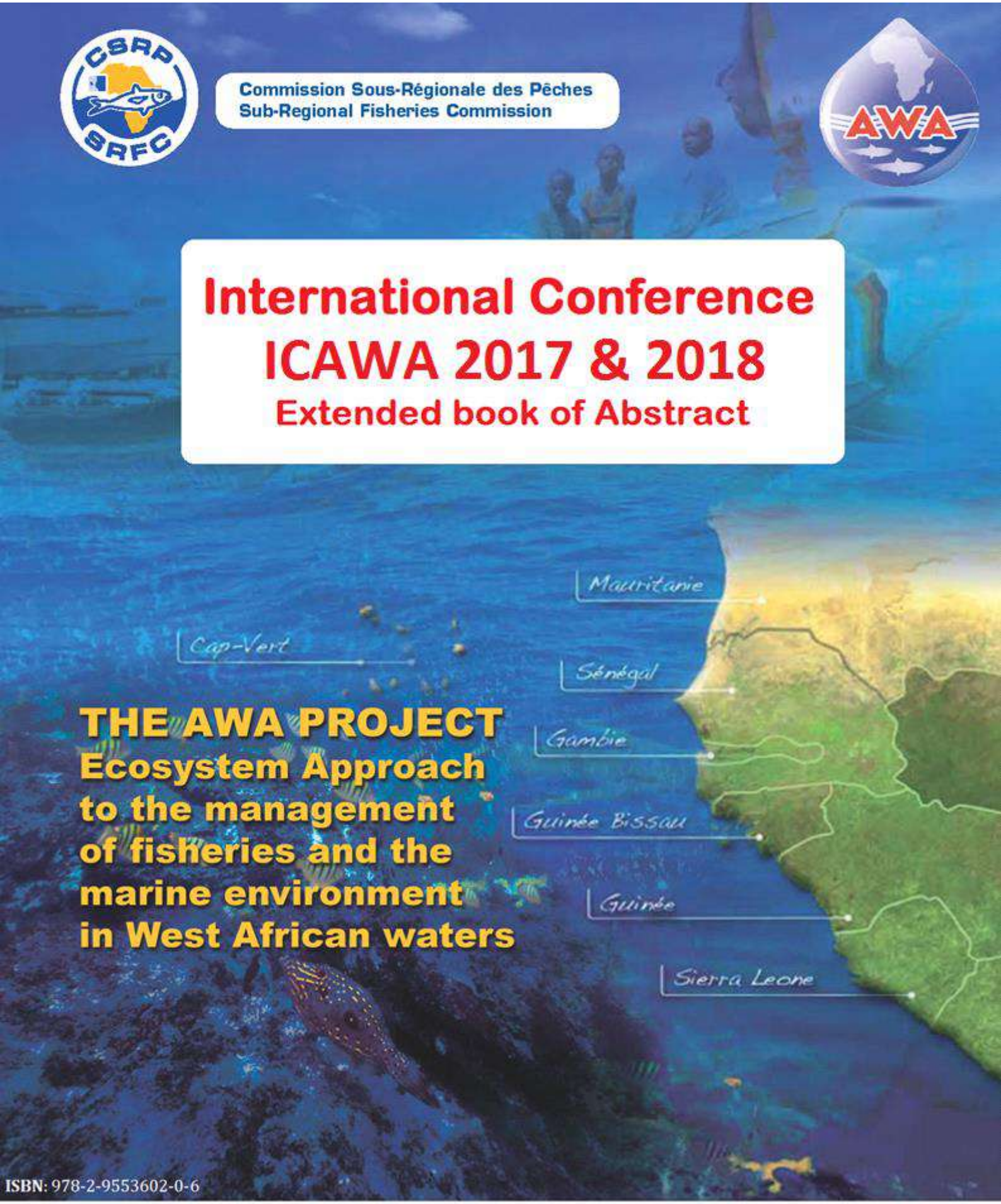
Abstract

The Benguela Current Large Marine Ecosystem (BCLME) is situated along the coast of south-western Africa, stretching from Tombua (Angola) in the north (16°N, 11°W) southwards to the east of the Cape of Good Hope (South Africa) (29°S, 17°E) and includes the study zone, from 17°S, 9°E to 31°S, 17°E. In this work, we focused on the Namibian continental shelf where fishing activities are mostly due to industrial fishing. Acoustic data were recorded with a 38 kHz echosounder, from 10 to 500 m depth over 8 surveys totalling 46 302 nmi from 1994 to 2001. To get homogenous data (i) only off-upwelling season surveys (October to June) 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 the Matecho tool. (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). Then, hot and cold spots were computed from the combined analysis of the spatial correlation and the Morans' I index of these values. (ii) On vertical dimension, the change of micronektonic spatial structure between day and night was assessed using the mean Sv value for each 1 m depth step. The inter-annual variability inside the eastern boundary upwelling ecosystem of the BCLME was analysed. (i) No significant change in micronektonic density was observed over the study period. Mean micronektonic acoustic density values observed were lower than in other African Atlantic large marine ecosystems. (ii) Hot and cold spots were spatially stable over time. Further analysis of physico-chemical parameters should improve the understanding of this pattern. (iii) A different vertical structure was reported between day and night, suggesting a migration from bottom to surface at dusk, as in the well-known diel vertical migrations. In perspective, physical processes occurring in the water column from turbulence to mesoscale activities should be considered in future studies.

Commission Sous-Régionale des Pêches
Sub-Regional Fisheries Commission

International Conference ICAWA 2017 & 2018

Extended book of Abstract



THE AWA PROJECT
Ecosystem Approach to the management of fisheries and the marine environment in West African waters

ISBN: 978-2-9553602-0-6

Bundesministerium
für Bildung
und Forschung

Institut de Recherche pour le Développement
FRANCE

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Trilateral German-French-African research initiative

Edited by

Patrice BREHMER (IRD, France)

Technical support: Ndague DIOGOUL (IRD, Sénégal), Cordula Zenk (Geomar, Germany) and Mahaut de Vareilles (UiB, Norway)

With the collaboration of

Noel Keenlyside (Norway), Jorge M. NASCIMENTO (CABO VERDE), Vito Melo RAMOS (CABO VERDE), Bamol Ali SOW (SENEGAL), Heino FOCK (GERMANY), Joern SCHMIDT (GERMANY), Werner EKAU (GERMANY), Adama MBAYE (SENEGAL), Assane FALL (MAURITANIA), Ivanice MONTEIRO (CABO VERDE), Aka Marcel KOUASSI (IVORY COAST), Osvaldina SILVA (CABO VERDE), Timothée BROCHIER (FRANCE), Moussa SALL (SENEGAL), Mohamed MAYIF (MAURITANIA), Vamara KONÉ (IVORY COAST), Thomas GORGUES (FRANCE), Carlos FERREIRA SANTOS (CABO VERDE), Idrissa Lamine BAMY (GUINEA), Iça Barry (GUINEA BISSAU), Momodou Sidibe (THE GAMBIA), Hamet Diaw DIADHIOU (SENEGAL)

ISBN: 978-2-9553602-0-6

Cover design: AWA (BMBF – IRD) project

Logo and flyers: Laurent CORSINI (IRD)

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.

Sponsors ICAWA 2017 and IACAWA 2018

These two edition of ICAWA were joint with OSCM inauguration and the final meeting of the European preface project, respectively in 2017 and 2018.

International PREFACE International Conference on Ocean, Climate and Ecosystems 17th to 20th APRIL 2018

Book of abstract and recommendations

International PREFACE International Conference on Ocean, Climate and Ecosystems joint with ICAWA 5th, editon 2018

Session 4: «Climate prediction Marine ecosystems, fisheries management and climate change». Thursday 19th April 2018

Poster presentation