



Session 03

Modelling *Sardinella aurita* spawning habitat and larvae dynamic in the Senegalese-Mauritanian upwelling

Baye Cheikh MBAYE^{1,*}, Eric MACHU², Vincent ECHEVIN³ and Timothée BROCHIER³

¹Laboratoire de Physique de l'Atmosphère et de l'Océan Siméon Fongang (LPAO-SF/ESP-UCAD), BP 5085 Dakar Fann, Sénégal

²Laboratoire de Physique des Océans, UMR 6523 (UBO, CNRS, IRD, Ifremer), Ifremer Centre de Brest, Plouzané 29280, France

³Institut de Recherche pour le Développement (IRD), ISRA/Centre de Recherche Océanographique de Dakar-Thiaroye (CRODT), UMR 195 LEMAR, BP 1386 Dakar, Senegal

*Correspondance: Tél: (+221) 77 44 62 940; Courriel: bayecheikha@gmail.com (B.C. MBAYE)

Reçu le 09/12/2014; publié le 15/05/2015

AWA © MS WP3_S3_3_1

Abstract

The stock of *Sardinella aurita* off North West Africa experience variability at different temporal scales. Here we study the interannual variability of this stock which is defined by annual evaluation surveys conducted between 1996 and 2006 by the R/V Fritdjof Nansen. On one side, we used a coupled physical-biogeochemical model (ROMS-PISCES) to investigate the spawning habitat of *Sardinella aurita* along the NorthWest African Coast. The potential habitat volume (PHV) used to assess sardinella habitat is defined as a function of depth, temperature and salinity which uses the ranges 0-60m, 22-26°C and 35.5-36psu respectively. The coupled experiment run is then used to represent the environment of fish individuals modeled through a Lagrangian approach (Ichtypop) which permit to evaluate retention and larvae survival within the spawning areas. Two main features emerge from evaluation surveys: 1- a reduction by around 2 of the biomass between 1996-1999 and 2000-2006 and 2- years 1998 and 1999 are characterized by exceptional recruitments. In this study, we used PHV, plankton biomass, retention success and larvae survival to investigate these patterns. PHV remains higher during the period 1996-1999 when acoustic biomass is important than the following years, the signal being stronger in the northern regions. This period of favorable spawning also corresponds to a period of low larvae mortality. It is hypothesized that the combination of high values of PHV and low larvae mortality is responsible for the important *sardinella* stock estimated for the years 1996-1999. In this presentation, we will also attempt to explain the high recruitment success observed for years 1998 and 1999.



Commission Sous-Régionale des Pêches
Sub-Regional Fisheries Commission



Book of Abstract International Conference ICAWA 2014

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

Cap-Vert

Mauritanie

Sénégal

Gambie

Guinée Bissau

Guinée

Sierra Leone



Bundesministerium
für Bildung
und Forschung



Institut de recherche
pour le développement



Liberté - Égalité - Fraternité
RÉPUBLIQUE FRANÇAISE
Ministère des Affaires étrangères
et du Développement International
Ministère de l'Enseignement
Supérieur et de la Recherche

Trilateral German-French-African research initiative

Edited by:

Patrice Brehmer (IRD) & Hamady Diop (SRFC/CSRP)

With the collaboration of:

Marie Madeleine Gomez, Ndague Diogoul, Viviane Koutob, Peter Brandt, Bamol Ali Sow, Alban Lazar, Xavier Capet, Heino Fock, Carlos F. Santos, Eric Machu, Hamet Diadihou, Didier Jouffre, Ibrahima Diallo, Joern Schmidt, Amadou Gaye, Mahfoudhould Taleb Sidi, Yves Gouriou, Rafael Almar, Moussa Sall, Dominique Duval Diop, Modou Thiow, Ross Wanless, Jacob Gonzales-Solis Bou, Ibrahima Ly, Dienaba Beye Traoré, Marie Bonnin, Werner Ekau.

ISBN: 978-2-9553602-0-0

SRFC/CSRP – IRD ©2015

Cover design: AWA (BMBF – IRD) project

Logo and flyers: Laurent Corsini (IRD)

Sponsors ICAWA 2014

