Session 03

Influence of fine scale processes on fish larvae retention in the Senegalese Upwelling region

Baye Cheikh MBAYE[1,*], Siny NDOYE[1], Xavier CAPET[2], and Eric MACHU[3]

[1]Laboratoire de Physique de l'Atmosphère et de l'Ocean Siméon Fongang (LPAOSF), UCAD/ University Cheikh Anta Diop, Dakar, Senegal
[2]LOCEAN, National Center for Scientific Research (CNRS), Sorbonne Universtes, UPMC, Paris, France
[3]Laboratoire de Physique des Océans, UMR LOPS, Plouzané, France

*Correspondance: Tél: (221) 77 446 29 40; Courriel: bayecheikha@gmail.com (B. MBAYE)

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Abstract

Mesoscale physical processes can affect the fate and distribution of fish eggs and larvae by aggregating and retaining them in favorable habitats or spreading them away to inappropriate areas. Here we examined the effect of fine scale processes on fish larval retention through a biophysical model of the early life stages of Sardinella aurita taken as an example within the Senegalese upwelling region. A set of 3 ROMS configurations is used from coarser (~9km, 7.5km) to finer (~ 2km) resolution. The ICHTHYOP individual based model is then forced by the different model experiments. To take into account more realistic physical forcing, the finer resolution configuration was used to test the effect of synoptic winds and tides. We first show that a finer resolution of physical processes provides a retention twice stronger. In addition that experiment shows 2 contrasted results in the region which differ from previous modelling work : 1) the northern domain considered so far as a low retention area displays high retention values and 2) a better resolution of the hydrodynamic of the Senegalese shelf modifies significantly the retention spatial patterns in the southern area although the seasonality remains similar. Simulation using synoptic winds and tidal forcing suggest a reduction of retention induced by a higher larval mortality due to enhanced export transport and stronger lethal temperature exposure.

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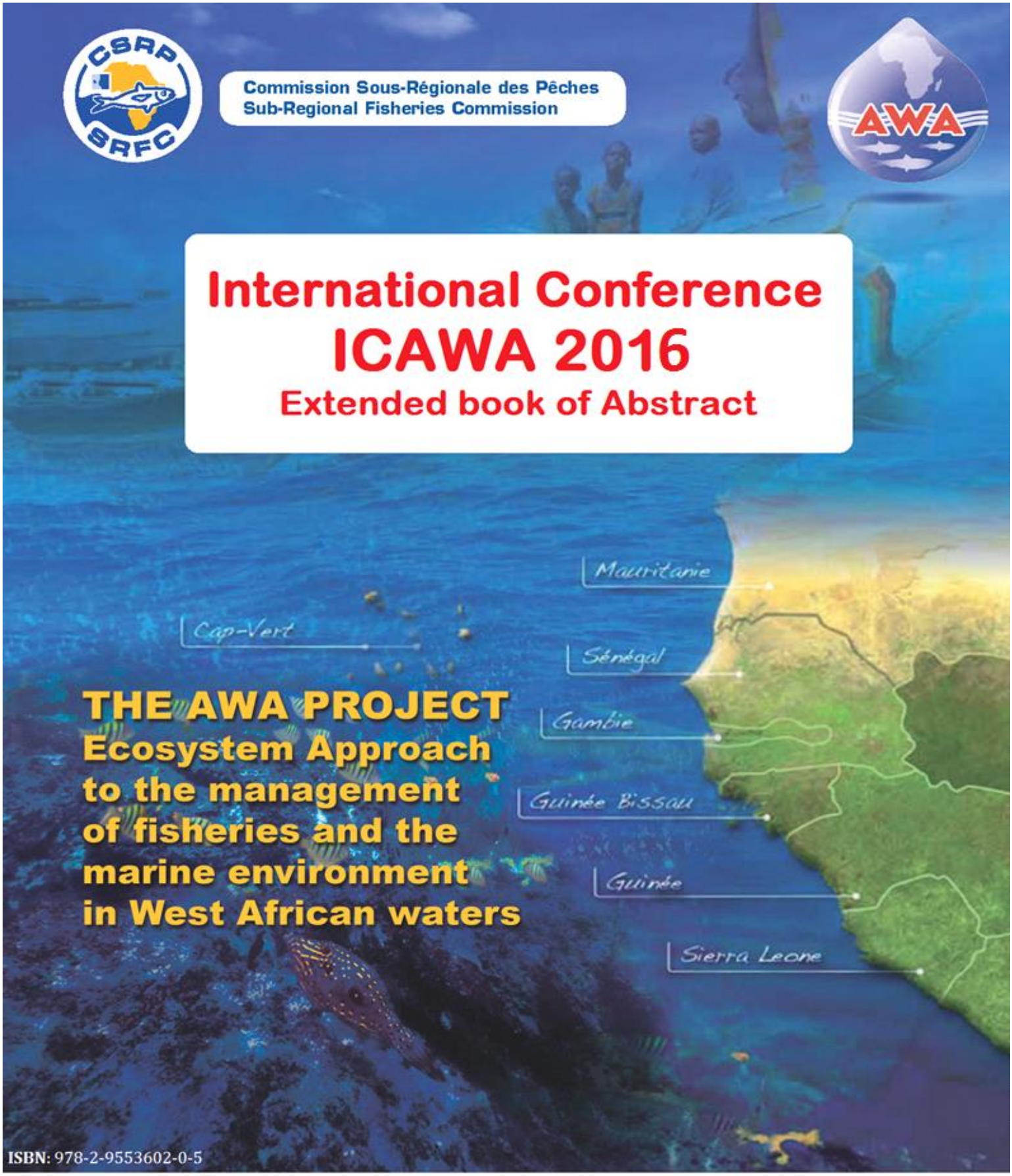

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WITH THE COLLABORATION OF:
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