*Session 02*

# Acoustic backscattering strength of plankton predicted from *in situ* digital holographic microscopy in an East Border upwelling

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## Abstract

Ocean planktonic organisms are diverse in species, versatile in time and space. In-situ remote observations are mainly done by a variety of acoustical and optical methods, which are seldom used simultaneously due to a lake of consistency between these two methods. In this paper, a survey trial on pelagic microorganism off the Senegal coast have been carry out, combined active fisheries acoustics *i.e.* scientific echosounder Simrad EK60 (38, 70, 120 and 200 kHz), and optical digital holography microscope "DHM" (HoloFlow@Sea). Ours results present the information about the horizontal and vertical profile, size of objects, the classes of microorganisms. For the identified objects through DHM, equivalent size of each kind class is used to process the acoustic backscatter strength according to scattering theory. Assuming the same observation value of scientific echosounder, prediction of backscatter strength is applied via integrated volume scatter. Trial results show that prediction method makes the combined use of acoustical and optical observation a promising way to reveal the fine and micro scale pattern of the zooplankton. The massive presence of phytoplancotnic organism in surface layer of some particular part of West African East Border Upwelling are suspected to contribute significantly to the volume backscatter recorded on the fisheries echosounder, and thus bias quantitative and qualitative estimation of macrozooplancton suing active acoustics systems.

**Keywords**: Ocean microorganism, Plankton, volume scatter, digital holography microscope, Echosounder, Target Strength, Resonant frequency, Holoflow@Sea, Senegal.

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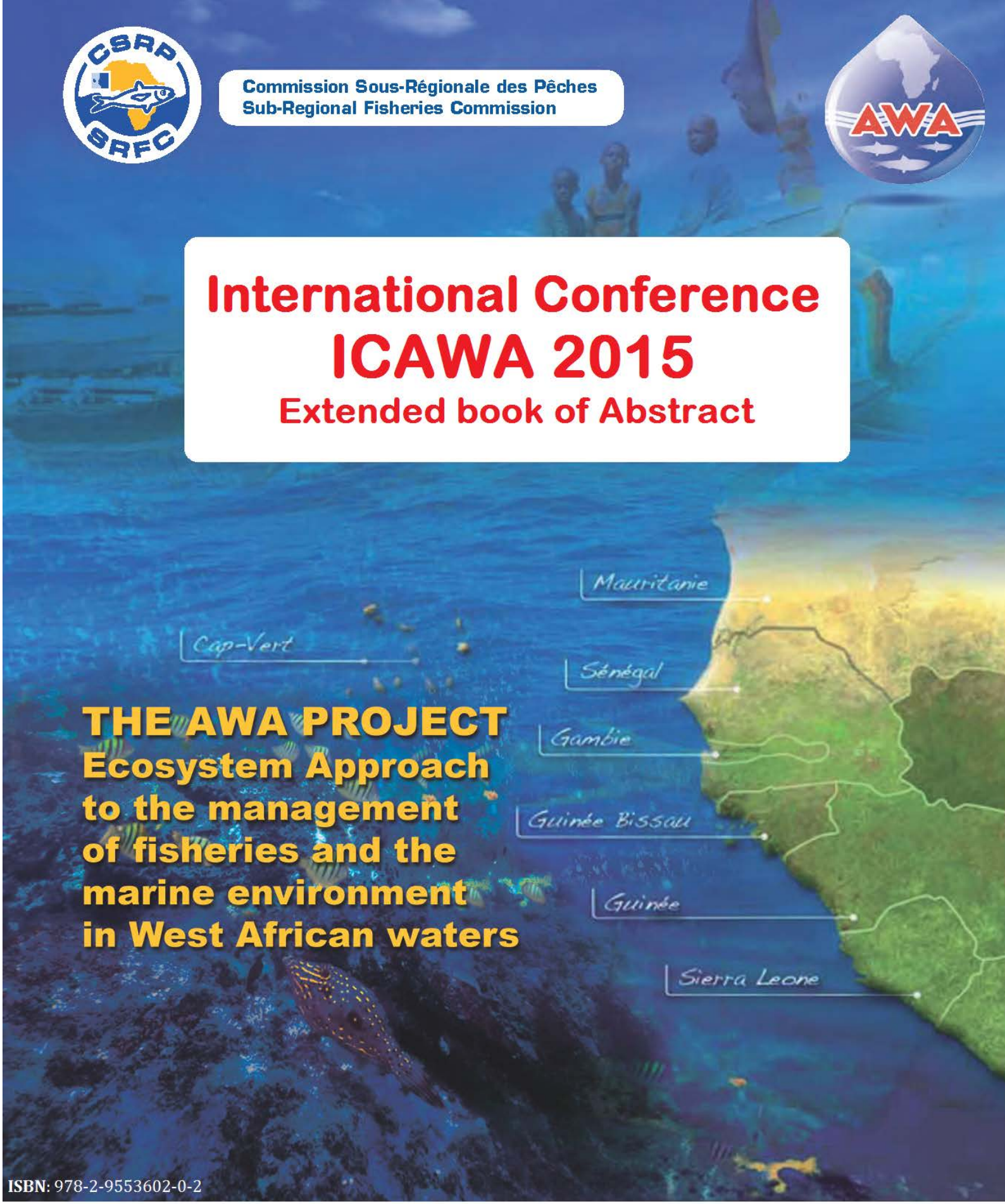
## Extended book of Abstract

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