Session 03

Towards quantifying the aerosol flux of trace and major elements: a case study of the West African Eastern Boundary Upwelling System

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Abstract

Aerosol deposition plays a key role in global climate, both directly (via changes to the radiative budget) and indirectly (as a source of essential elements for primary production). It has been proposed that the Eastern Boundary Upwelling System (EBUS) of the Canaries current large marine ecosystem is more efficient than its counterpart in the Pacific (Humboldt and California currents) due to the greater availability of iron (Fe) in the Atlantic EBUS. Due to its proximity to the Sahara/Sahel region the North Atlantic Ocean receives ~ 200Tg/year of dust (a significant source of Fe), much of it deposited under the 'Saharan plume' (~10-25°N). However, there are uncertainties associated with the strengths and mechanisms of future dust supply, and this parameter remains one of the least-well quantified aspects of the global climate system. Our project aims to address this problem by providing field data for constraining aerosol terms in ecological and biogeochemical models. In order to estimate atmospheric inputs off the coast of West Africa, trace element concentrations were determined from aerosol samples from AWA (RV Thalassa), UPSEN-2 and ECOAO (RV Antea) cruises. Elemental ratios and enrichment factors are presented that demonstrate the desert origin of the samples, but also highlight that the aerosols are not pure end-member soils as enrichment of pollution-derived elements points to anthropogenic impacts.

Keywords: Aerosol; Iron, EBU; ECOAO, Upsen2, Senegal.

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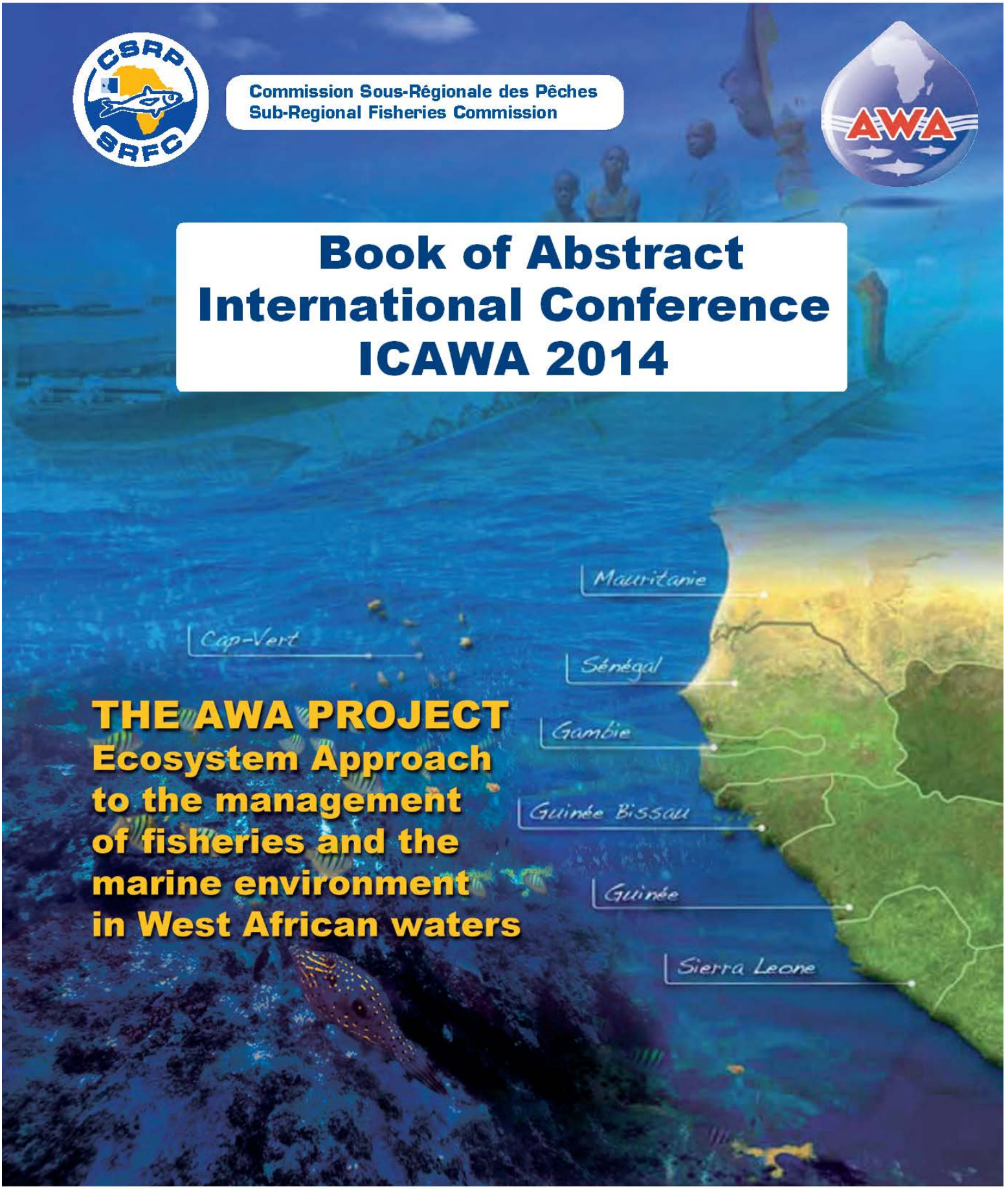

THE AWA PROJECT
Ecosystem Approach to the management of fisheries and the marine environment in West African waters

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