

AURITA

Western African small pelagic fish populations' resilience



Institut de Recherche
pour le Développement
FRANCE

ALTERNATIVE SAMPLING STRATEGY FOR THE ASSESSMENT OF THE ARGUIN BANK IMPACT ON THE WESTERN AFRICAN SMALL PELAGIC FISH POPULATIONS' RESILIENCE



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DESCRIPTION

In recent year, modeling approaches that aim to inform the onset of Ecosystem Approach to Fisheries (EAF) have developed tremendously and new concept like EAMME already arise. However, there is a lack of field data specifically collected to confirm and improve the models prediction. In West Africa, the exploitation of Small Pelagic Fish (SPF) is a crucial matter for population's food security and economy. Multiple stressors may act on population dynamics and must be taken into account in the models, e.g. increasing fishing pressure, environmental variability and marine pollution. These stressors impact on short-lived SPF species abundance variability, which mainly occur during the reproduction period, and there is evidence that a ~7000 km² shallow waters area of the north west African coast, the Arguin Banc in Mauritania, may be a major nursery area, including for several transboundary species that contribute to the Fisheries resources exploited along the coast of 7 countries, from Morocco to Guinea [Brochier et al., under review]. Such ecosystem service is a major contribution to the national economy at least for Mauritania, South the Sahara bank and Senegal. Yet, the Arguin Bank is significantly under sampled due to its shallow depth (~ 10m, see Fig. 1) that prevents standard oceanographic research vessels to enter this area, and largely under-studied due to its location in one of the less developed countries of the world. Satellite chlorophyll-a, Sea Surface Temperature and wind estimates may also suffer of strong biases due to the very coastal characteristics of the area. However, recent instrumental development in France together with the "big data" analysis methods revolution that goes on now allows the onset of operational autonomous systems to perform continuous in-situ observations and sampling

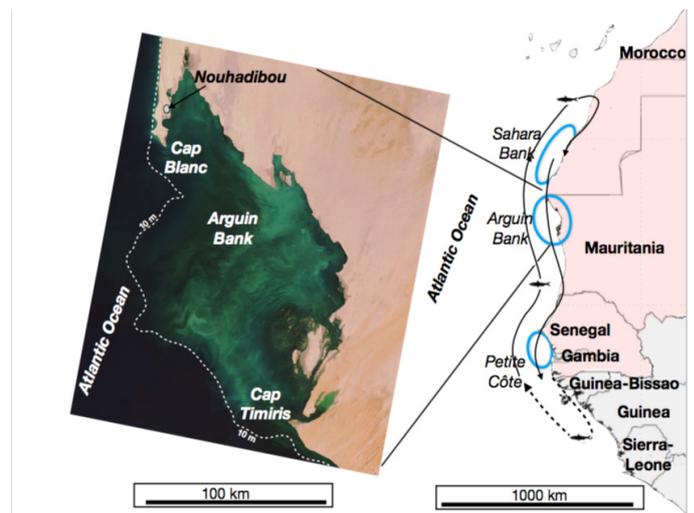


Figure 1: Left: Arguin Bank satellite imagery (MODIS), with clearly visible shallow waters area. Right: Round sardinella seasonal migration pattern (black arrows), location of the main documented small pelagic fish nursery (blue circles) and political borders, in pink the countries for which small pelagic fisheries issues have major economic and food security impacts.

of the small pelagic fish species reproduction. In particular, the Marine Protected Area status of the Arguin bank makes this area a good demonstration place for the onset of such methods that could be later deployed in other areas. Finally, the costs (~ 60 k€ per instrumented boat that will last for years of a long term continuous, autonomous sampling) are cheap compared to the average 10-30 k€ per sampling day with a conventional research vessel.



Photo : Natalie Cadot

Figure 2: The Arguin Bank is the largest marine protected area in West Africa. The sailing fishing boats are the only authorised in the area.

