persistence since 1996, allowed that region to become the dominant anchovy spawning ground, and that dominance has persisted since then. In the context of Global Climate Change, this example can be used to infer the response to changes in the environment of similar species in other upwelling ecosystems.

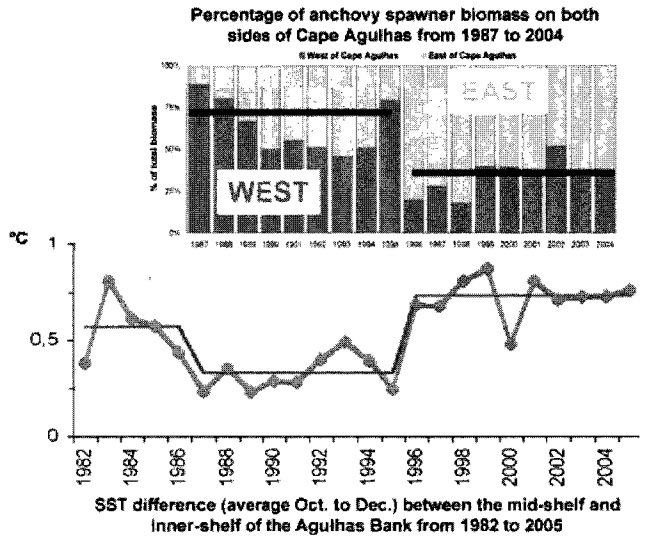

Figure 1: Environmental variability over the Agulhas Bank (bottom) and percentage of anchovy spawner biomass located on both side of Cape Agulhas (top). The abrupt shift of the spawner biomass to the east of cape Agulhas in 1996 corresponds to a sudden increase of the SST gradient between the mid-shelf and inner-shelf regions of the bank. Data on anchovy egg distribution dating back from the early eighties provide also evidence of enhanced anchovy spawning on the eastern Agulhas Bank in 1983.

HCS080 - The relationship of anchovy and sardine to water masses in the Peruvian Humboldt Current Ecosystem from 1983-2005

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Although the large fluctuations in abundance of anchovy (*Engraulis ringens*) and sardine (*Sardinops sagax*) off Peru have been well documented (e.g. Alheit and Niquen, 2004; Bertrand *et al.* 2004; Gutierrez et al., in press) little is known about the functional processes underlying these dynamics in relation to ENSO events and/or decadal regimes. It has been hypothesized that colder upwelling waters provide favourable habitat (hydrologic and feeding conditions) for anchovy while sardine appear to be favoured by warmer oceanic waters habitat. In this work we use water masses as a proxy of habitat conditions. Data from 44 acoustic surveys conducted off the Peruvian coast from 1983-2003 by the Peruvian Marine Institute (IMARPE) provide an unique opportunity for testing the hypothesis of a relation between the range of distribution of these water masses and the abundance of these species. If such a relationship can be established it may suggest that the expansion and contraction of sardine and anchovy populations tracks expansion and contraction of the range of colder upwelling and warmer oceanic waters in Peruvian coastal waters. To monitor changes in water masses composition we constructed an algorithm for determining water masses based on temperature and salinity ranges but also on season and latitude ranges. Classification and Regression Trees (CART) using recursive partitioning, modelling sardine and anchovy presence-absence as a function of year, water mass and latitude showed that anchovy were primarily found in cold and mixed waters, while sardine were more ubiquist relative to water masses. This result was supported by Generalized Additive Model (GAM) analysis of anchovy and sardine abundance versus temperature and salinity as well as spatiotemporal variables. The predominance of cooler, upwelling associated water masses since 1999, can help to explain the absence of sardine and the more pervasive nature of anchovy in the Humboldt Current System. The extension-contraction of the range of distribution of these species according to the availability of each water masses is discussed.

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