Biomass estimate and temperature condition of seven species in Mauritanian waters

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Introduction

The coastline of Mauritania stretches about 720 km along the east coast in northwest Africa. Mauritania has an exclusive economic zone (EEZ) with an area of 234,000 km² including a continental shelf of 39,000 km². The current evaluation of total annual fishery resources available in Mauritanian waters is 1.9 million tons of which 1.4 million tons are small pelagic fish stocks (Khallahi et al., 2020). In this research, we estimated biomass index of seven commercial pelagic fish stocks from scientific survey data and explored the relationship between species geographical distribution and ambient temperature.

Objectives

The goal of this project is to acquire knowledge to scrutinize raw acoustic backscatter collected during scientific surveys of small pelagic fish resources within the Mauritanian EEZ. To calculate stock biomass index from survey data and relate species distribution to temperature conditions.

Study area

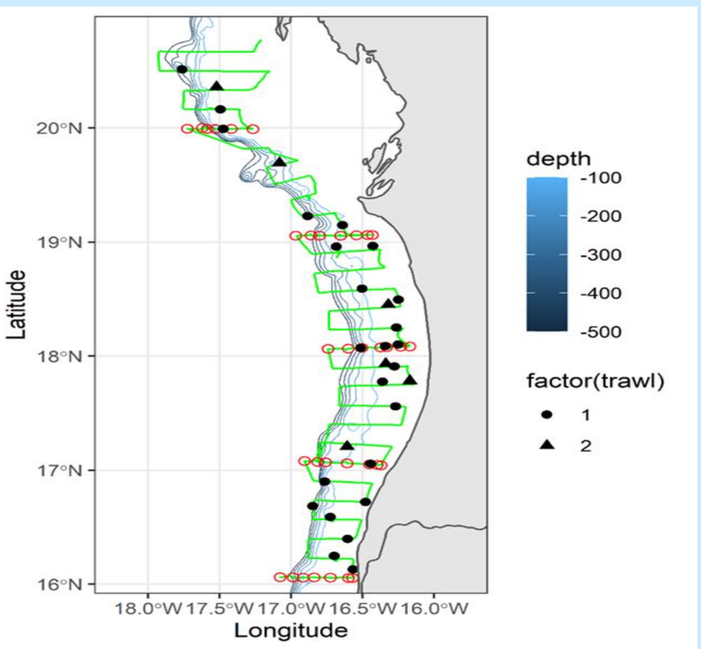


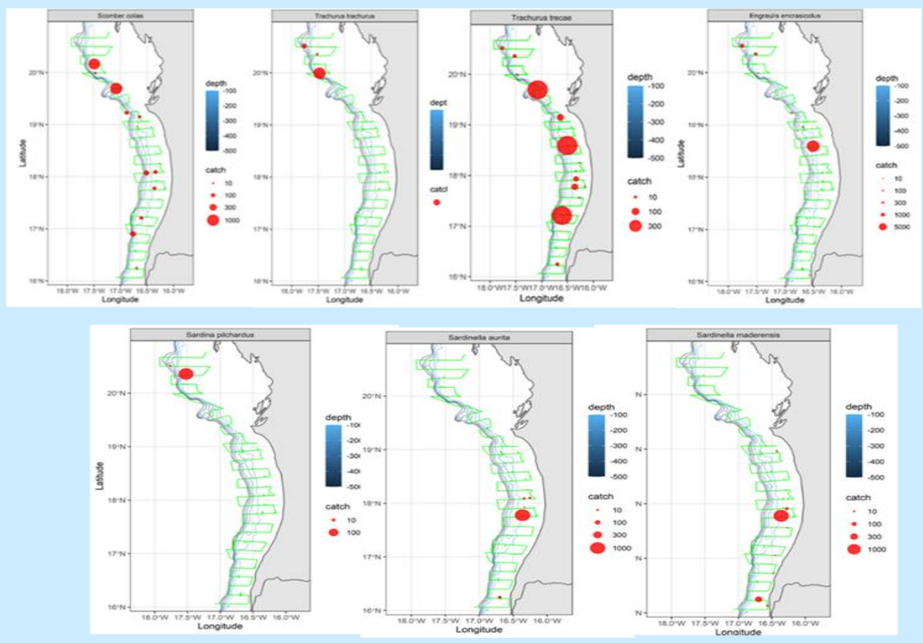
Figure 1. Survey track, trawling locations (●▲) and temperature measurements (○). Trawling was either on the bottom (▲) or in the water column (●) during an acoustic survey R/V Dr Fridtjof Nansen 27 June – 9 July 2017.

Methodology

Acoustic data were post-processed using the post-processing software Large-Scale Survey System (LSSS) Version 2.0, for data processed after fixing the bottom and surface line. For the surface line we allocated backscatter fish from 10m, then excluded sailing between transects. The acoustic data was preprocessed. Species allocation based on the species proportion in catch, See Toresen *et al.* (1998) for details.

Results

Catches distributions per species



Catch distribution varied between target species. Sardine and horse mackerel were more abundant in the northern zone, anchovy in the northern and central zone, both sardinella species were present in the central and southern zone, chub mackerel and cunen hours mackerel show a wide distribution (figure 2).

Figure 2.Catches distribution for chub (*Scomber colias*), Atlantic (*Trachurus trachurus*) and cunen horse mackerel (*Trachurus trecae*), anchovy (*Engraulis encrasicolus*) Sardine (*Sardina pilchardus*), round (*Sardinella aurita*) and flat sardinella (*Sardinella maderensis*).

Temperature condition

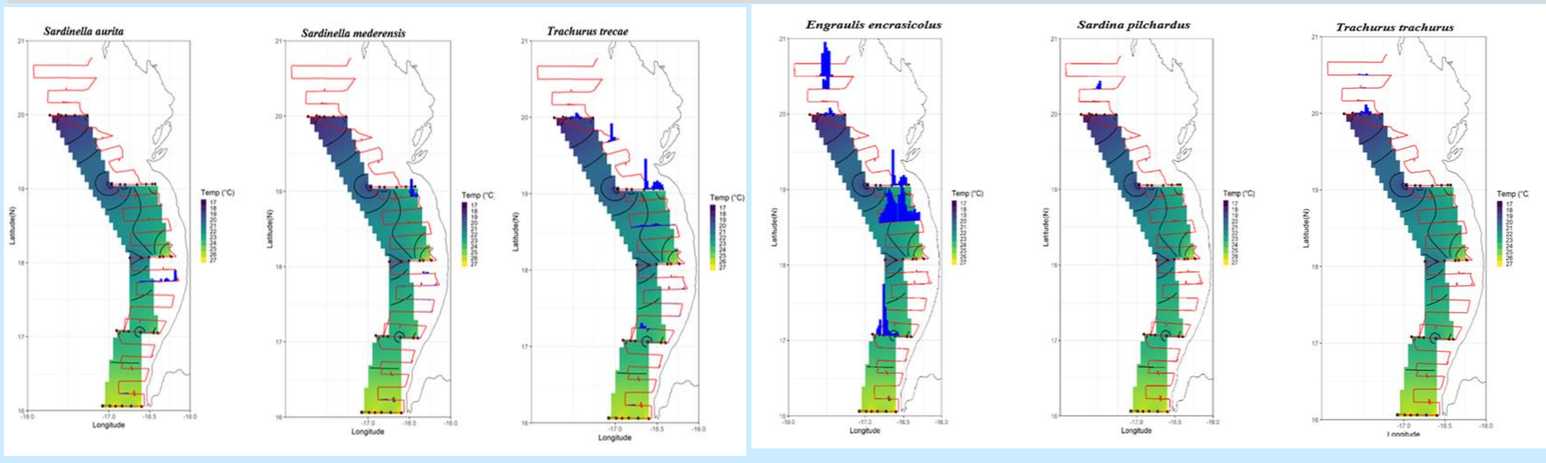


Figure 3.Target species backscatter (blue vertical bars)-and temperature, average for depth range of species (shaded yellow to blue area), and survey track of research vessel (red line).

Biomass estimate

Species	*Sardina pilchardus*	*Sardinella aurita*	*Sardinella mederensis*	*Trachurus trachurus*	*Trachurus trecae*	*Engraulis encrasicolus*	*Scomber Colias*
Biomass in 1000 T	21	62	116	37	130	552	0.166

Discussion

These results show that temperature influences species geographical distribution. (Chub mackerel, Atlantic horse mackerel, and sardine prefer colder waters ranging from 17 °C and 22 °C, in the northern part of the EEZ, and round sardinella, flat sardinella and cunen horse mackerel prefer waters > 20 °C , in the central and southern part of the EEZ.

Conclusion

It was discovered that anchovy and cunen horse mackerel could adapt themselves in both colder and warmer waters from the north to the southern area, however, the biggest biomass estimate was the anchovy followed by cunen horse mackerel and flat Sardinella, generally, these species were found in a shallower area with a depth of less than 100m.