

The main goal of IMPALHA is to **identify, characterize and quantify the impact of longline fishing gears on the seafloor, specifically on the marine benthic habitats in the Avilés Canyon System**

Background

An important longline fishing activity is conducted in the Avilés Canyon System (Figure 1), located on the continental margin off the western coast of Asturias (Bay of Biscay). This structurally highly complex area is conformed by three submarine canyons (Avilés, El Corbiro and La Gaviera), a marginal platform (Canto Nuevo) and a tall structural rocky mass (Agudo de Fuera).

The geomorphological characteristics of the area comprises a variety of benthic habitats, including seafloors populated by sensitive species such as corals and sponges (Sánchez et al. 2014). Depending on the fishing tactics, type of gear and target species, the impact on these sensitive species and habitats may be different.

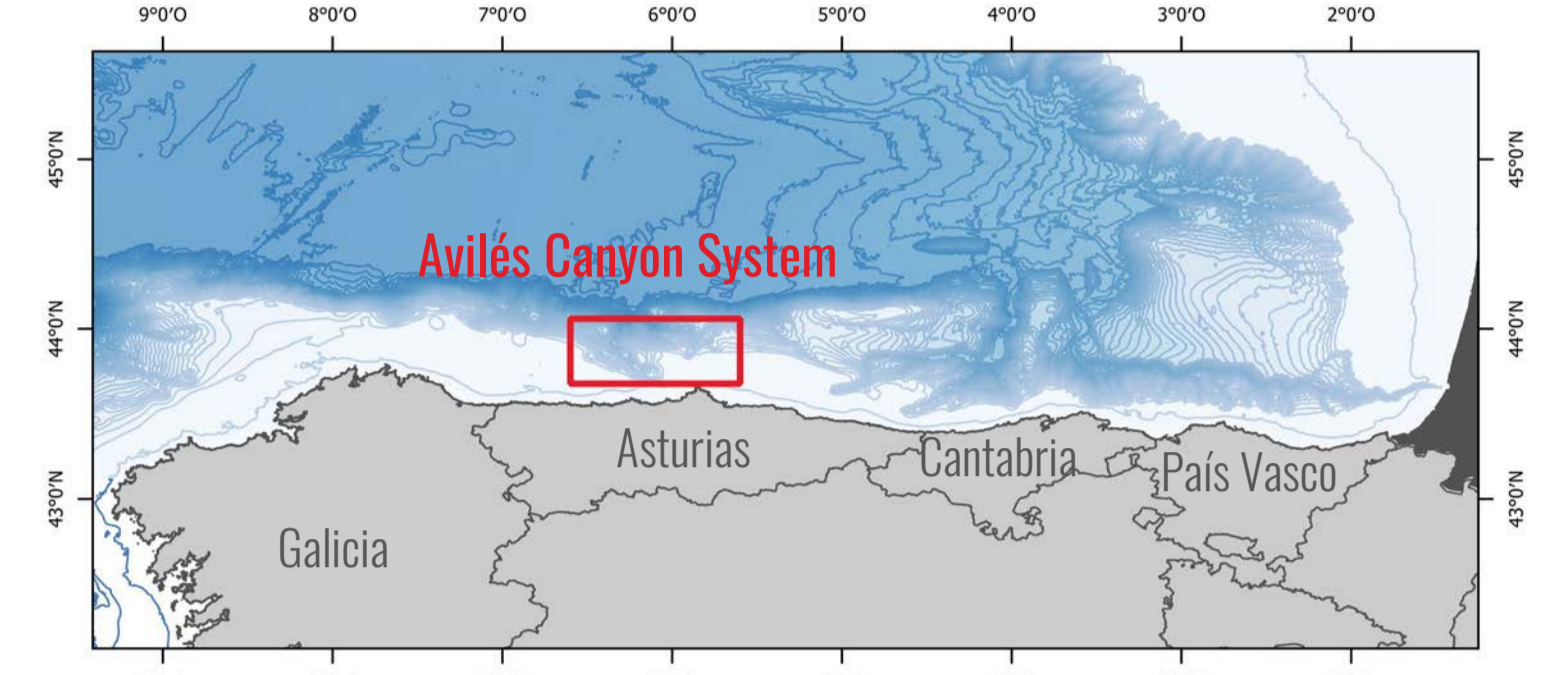


Figure 1. Study area.

In order to study the spatial distribution of fishing intensity, different tracking devices such as the Vessel Monitoring System (VMS) and the Automatic Identification System (AIS) were used. VMS data is a satellite based monitoring system which provides information related to the location, heading and speed of vessels for industrial fleet (length overall ≥ 15 m). AIS is an alternative tracking system used for vessel traffic monitoring system and provides available information for both, industrial and artisanal fleets.

In this study, VMS and AIS data from 2020 were used. After filtering and processing data, to eliminate signals not related to fishing activity, both datasets were combined with fisheries information from the Electronic Recording and Reporting System (ERS), daily fishing gear type was assigned to each signal. Catches and fishing effort (h/km² for VMS and signals/km² for AIS) were also used to characterize the longline fishing activity.

Results

Two fishing tactics, two types of gears targeting different species, were identified:

- Longline gear called Piedra-Bola, target species *Merluccius merluccius* (european hake) and *Pollachius pollachius* (pollack).
- Longline gear called Palangrón, target species *Conger conger* (european conger) and *Phycis blennoides* (greater forkbaerd).

AIS versus

VMS

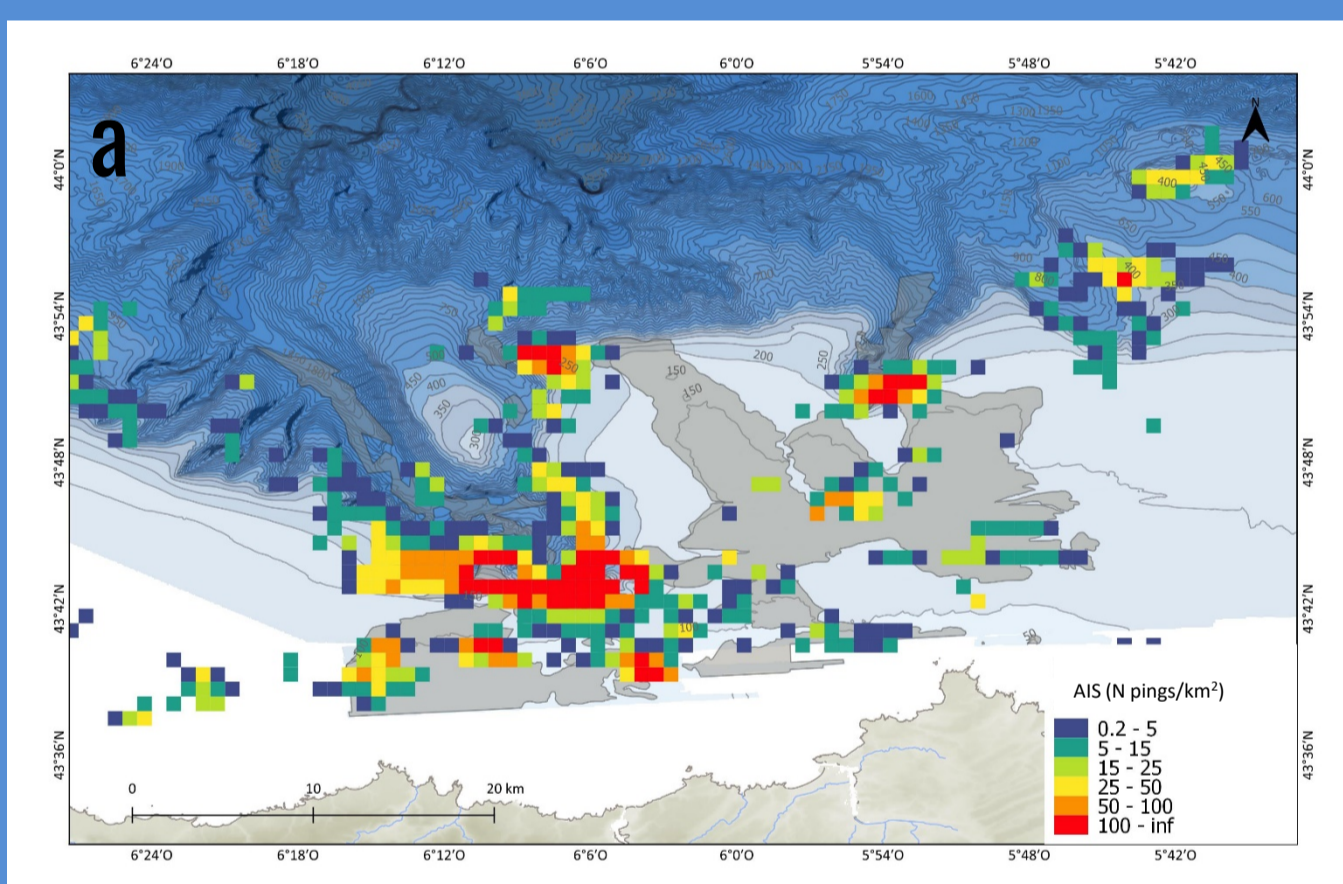


Figure 2a. AIS, Number of signals per square kilometre for both fleets (artisanal and industrial).

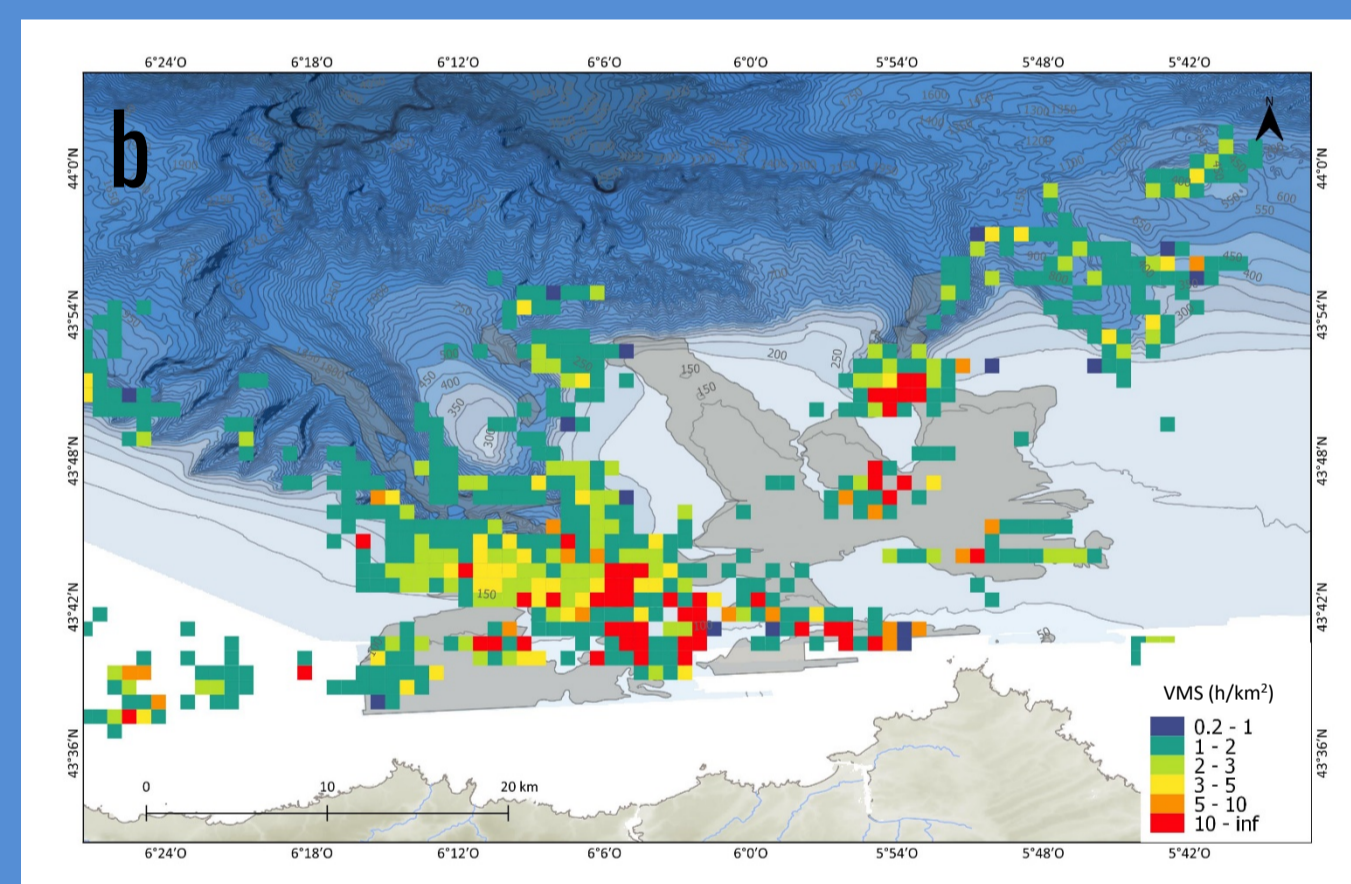


Figure 2b. VMS, fishing effort (hours/km²) for industrial fleet, LOA > 15m.

The distribution pattern of fishing effort was similar using VMS or AIS data, thus both systems (AIS and VMS) could be suitable to identify the zones where the fishing pressure was higher (red coloured in Figures 2a and 2b) and the benthic habitats in the area likely to be impacted.

Industrial AIS versus

Artisanal AIS

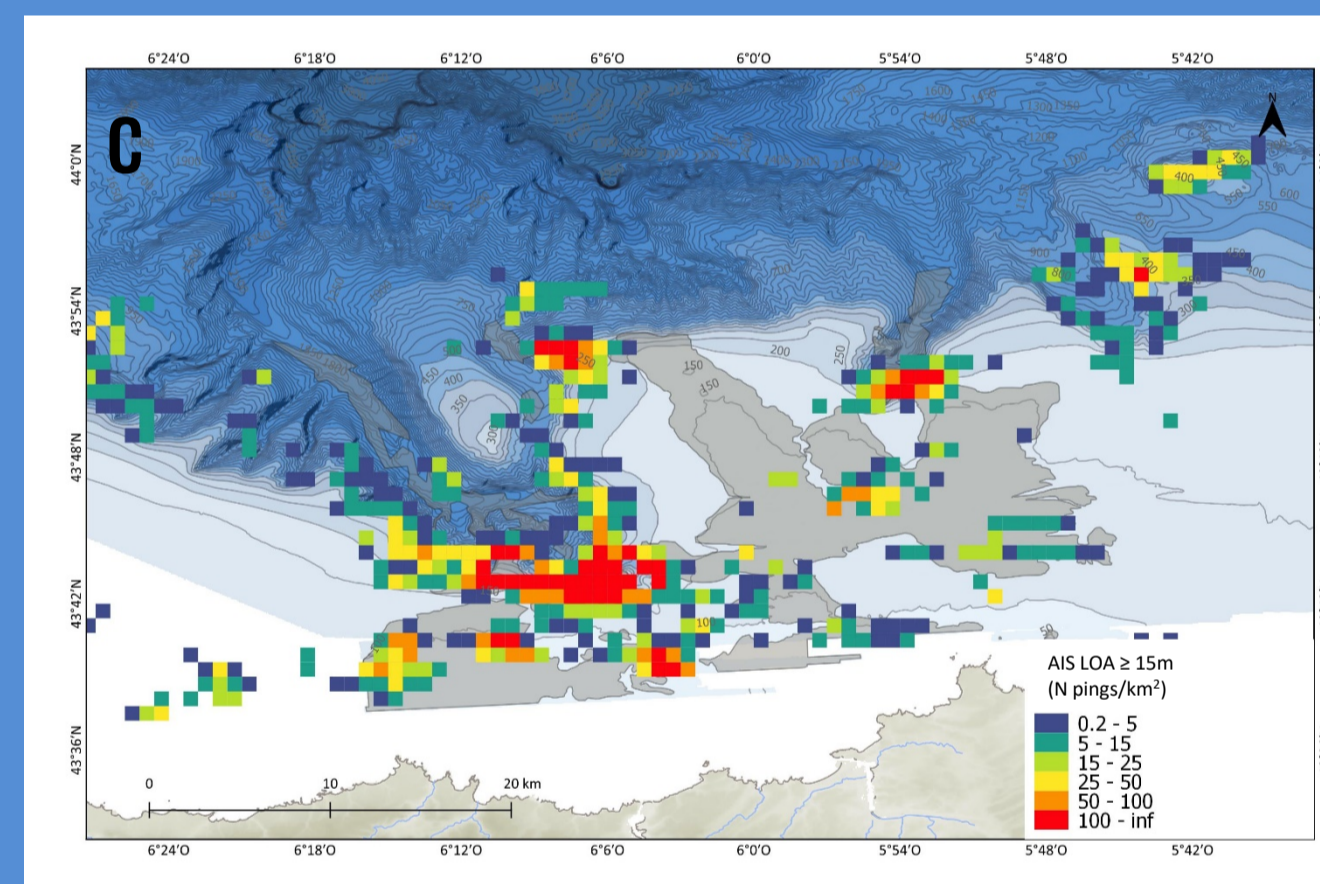


Figure 2c. Industrial AIS, number of signals per square kilometre for industrial fleet.

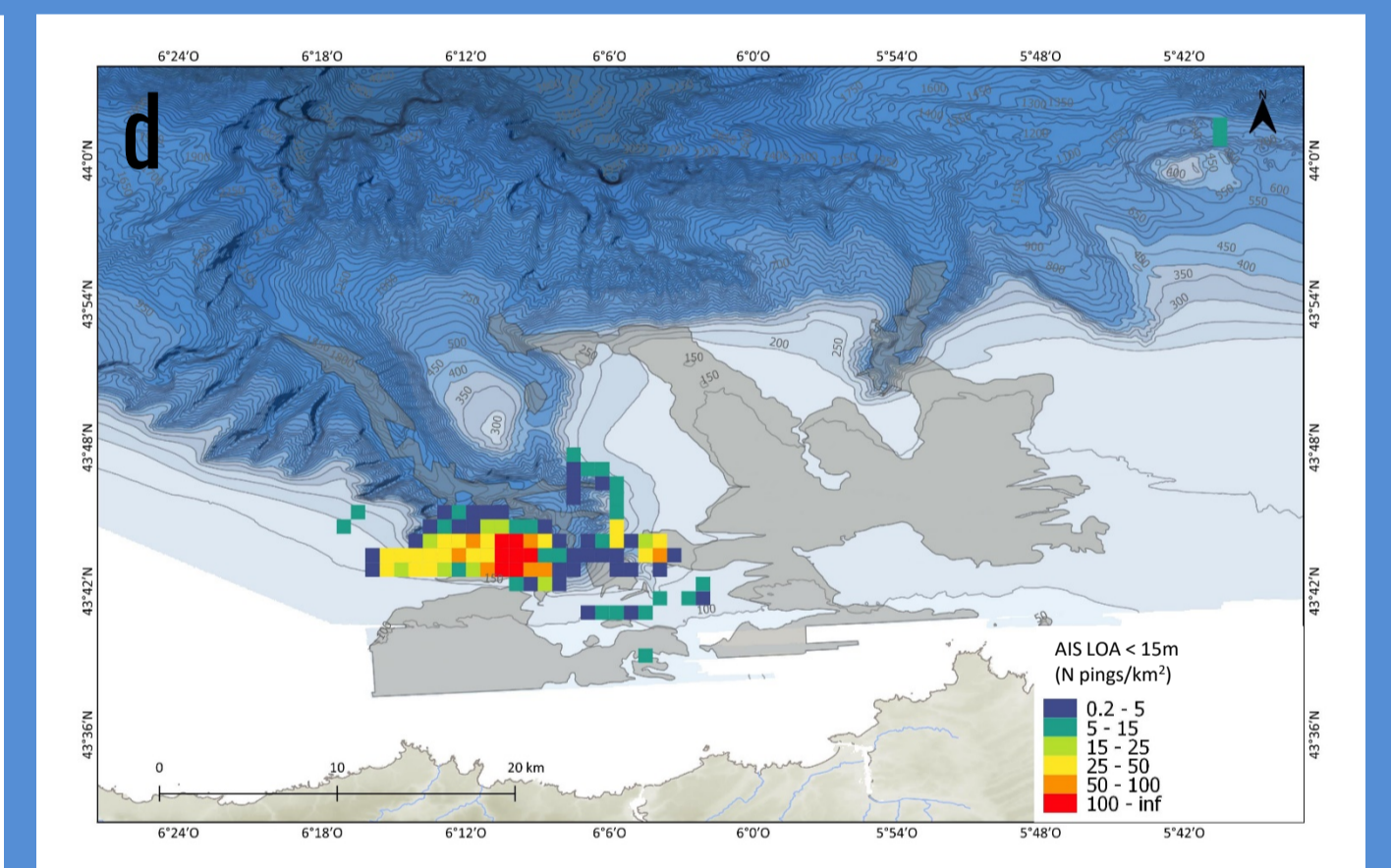


Figure 2d. Artisanal AIS, number of signals per square kilometre for artisanal fleet.

Additionally, using AIS data, it was possible to identify and segregate the distribution pattern of industrial and artisanal fishing pressure. Industrial fleet showed a spread distribution (Figure 2c) while artisanal pressure (Figure 2d) was concentrated in the headwater of the Avilés canyon, closer to the coast.

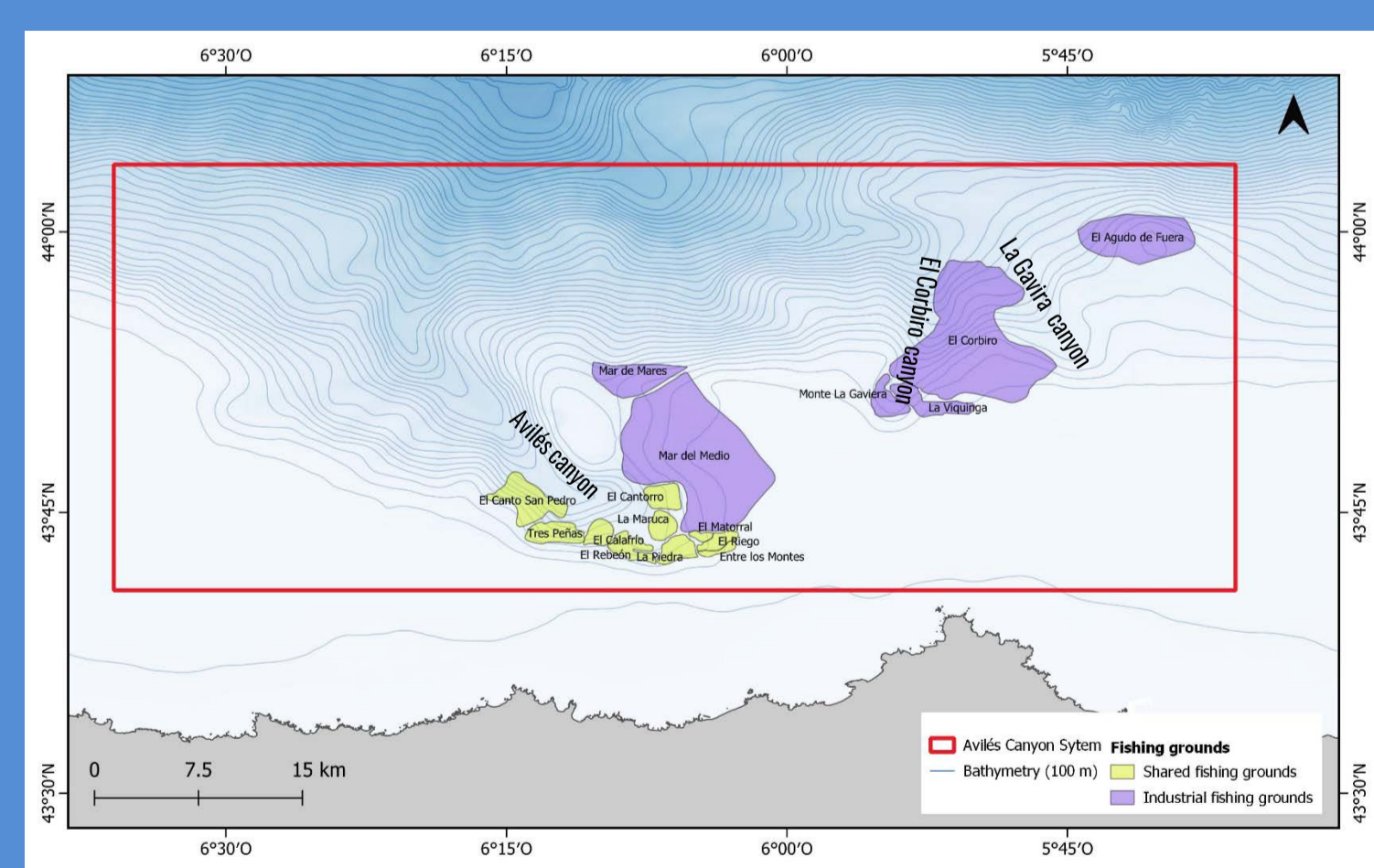


Figure 3. Main fishing grounds where operate longline fleets.

High overlap between industrial and artisanal effort distribution was found in the eight green-coloured fishing grounds in Figure 3, around the headwater of the Avilés Canyon and located over rocky bottoms (Figure 4).

Industrial fleet also expanded the activity to farther fishing grounds, where the geomorphological characteristics and seabed habitats are different (figure 4). Several fishing grounds were located on the flanks of the three canyons and the farthest and easternmost one, called El Agudo de Fuera, on the rocky mass (purple-coloured in Figure 3).

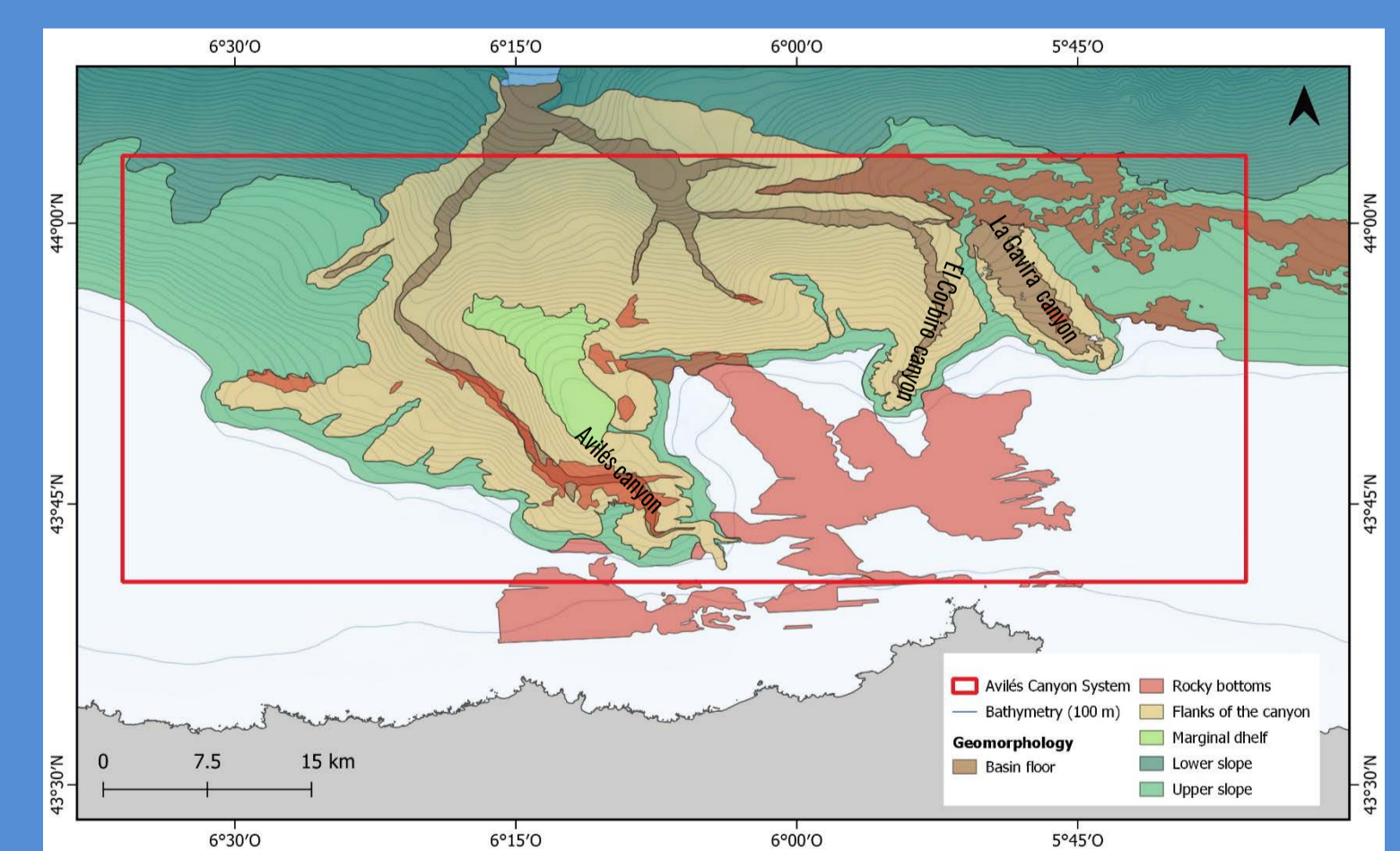


Figure 4. Geomorphological characteristics of the Avilés Canyon System.

Discussion

Our results show that the new source of information (AIS) improves the characterization of the longline fishing activity in the Avilés Canyon System. Therefore, a better quantification of the pressure of the fishing over the vulnerable benthic habitats is possible. Thus, new indices of vulnerability/sensitivity of the species or habitat object of protection to this pressure should be calculated, in order to better identify, characterize and quantify the impact of longline fishing gears on the benthic habitats.

The development of this new tools could be used to zoning and better manage the Marine Protected Areas, conserving the species and habitats, maintaining the ecosystem functioning, and ensuring sustainable use of marine resources.

References

Sánchez, F., Gómez-Ballesteros, M., González-Pola, C., Punzón, A. Sistema de cañones submarinos de Avilés. Proyecto LIFE +INDEMARES. Ed. Fundación Biodiversidad del Ministerio de Agricultura, Alimentación y Medio Ambiente. 2014.