

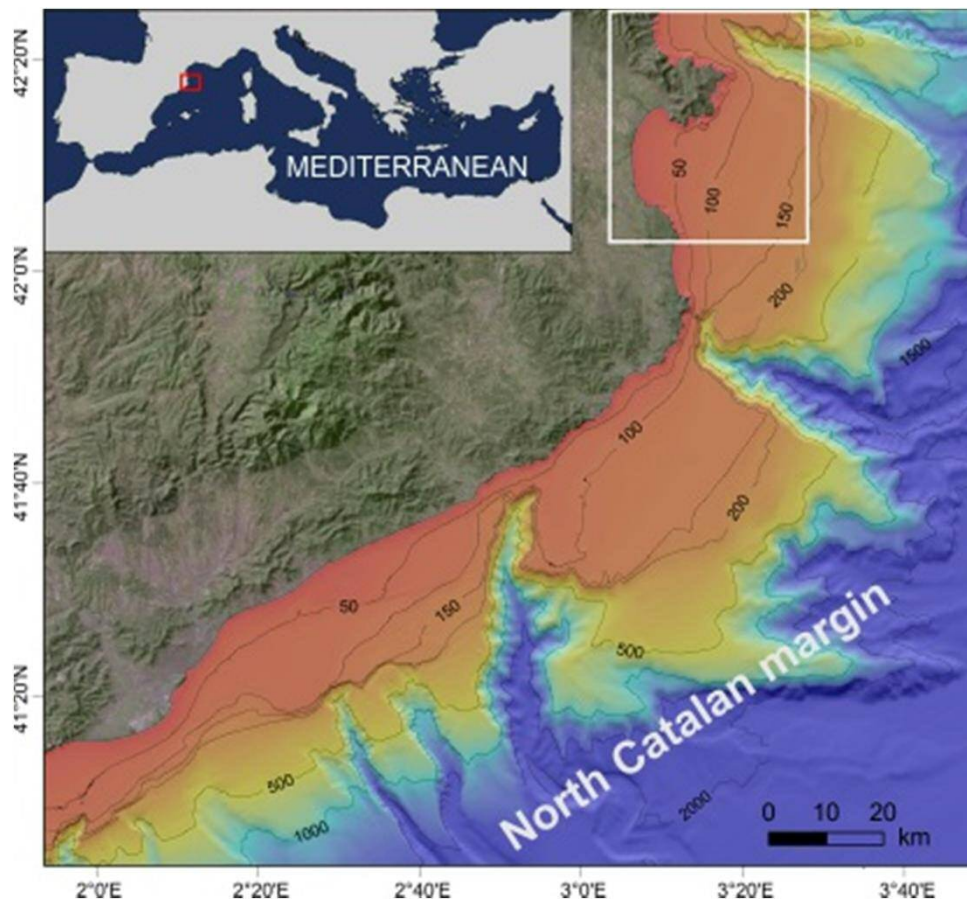
# Long-term seafloor morphological changes generated by bottom trawling on the northern Catalan continental shelf (NW Mediterranean)

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## Study area and methods

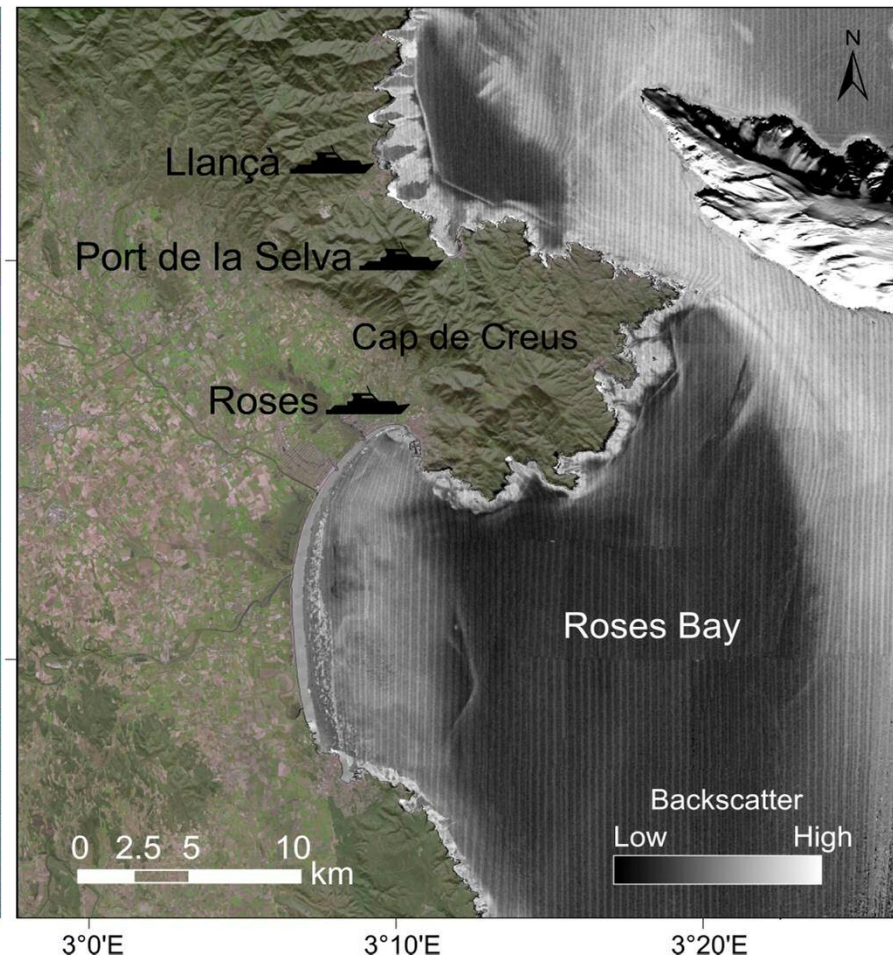
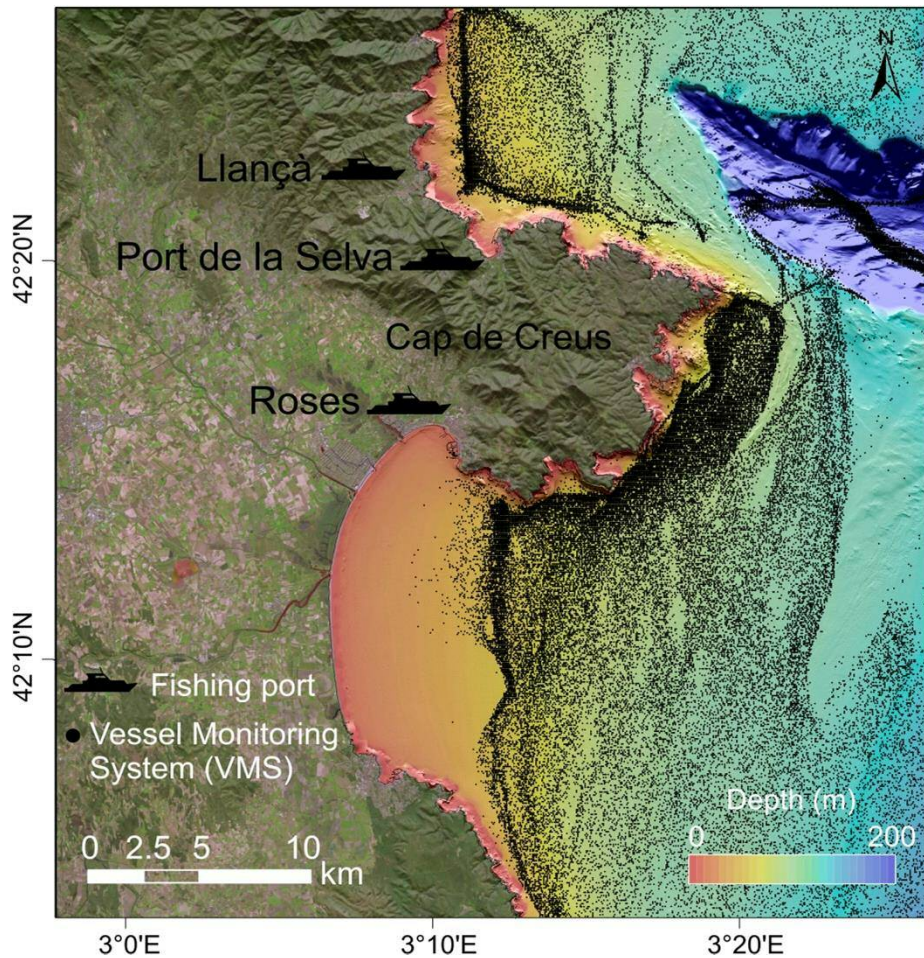
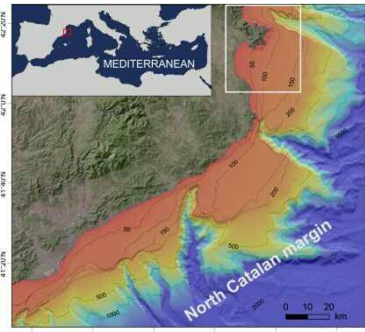
Data used to investigate the impact of bottom trawling on the seafloor morphology of the northern Catalan continental shelf (NW Mediterranean) include:



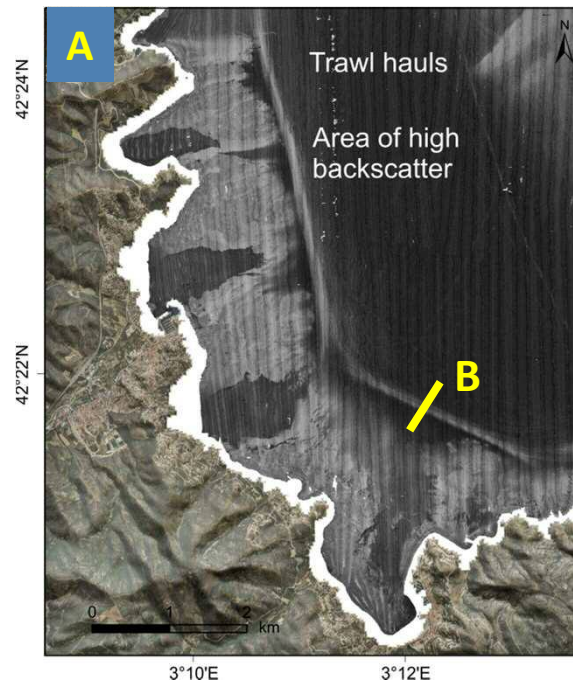
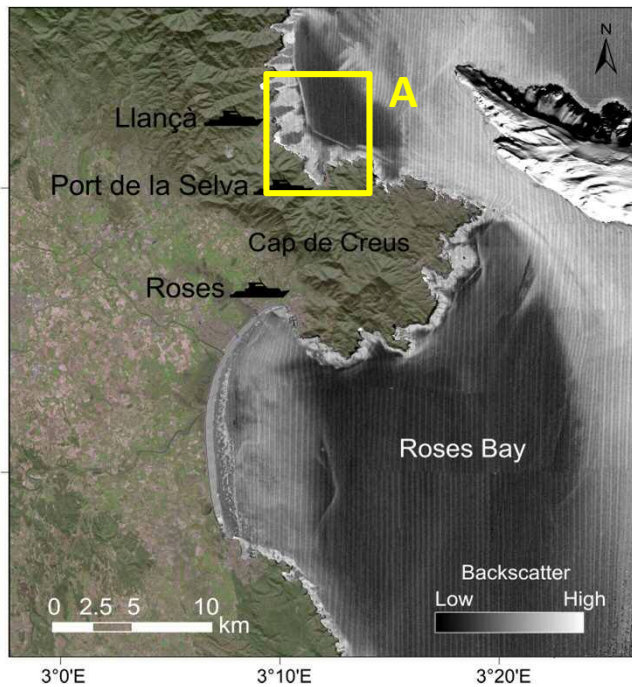
- ✓ **Kongsberg EM 3000 Dual Multibeam echo sounder data** (bathymetry and backscatter)
- ✓ **Edgetech DT1 Side scan sonar images**
- ✓ **HAPS bottom corer sediment samples**
- ✓ **Satellite-based navigation tracks (VMS)** from all large bottom trawlers operating in the study area during 6 years (2006-2011)

## Fishing grounds and backscatter

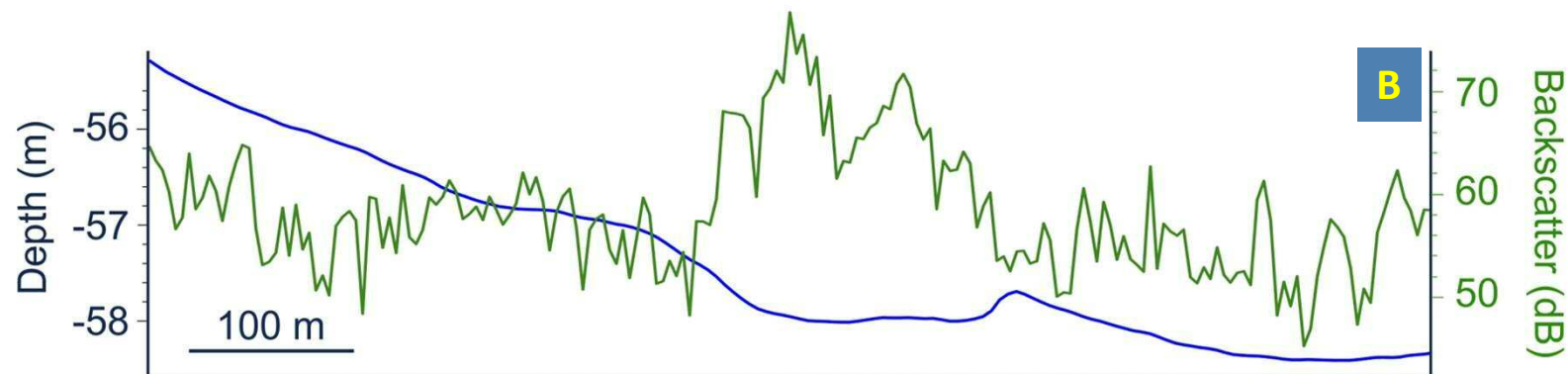
A great correlation between the maximum fishing and narrow (120-250 m wide) and discontinuous high backscatter facies was observed along the 50-60 m depth range.

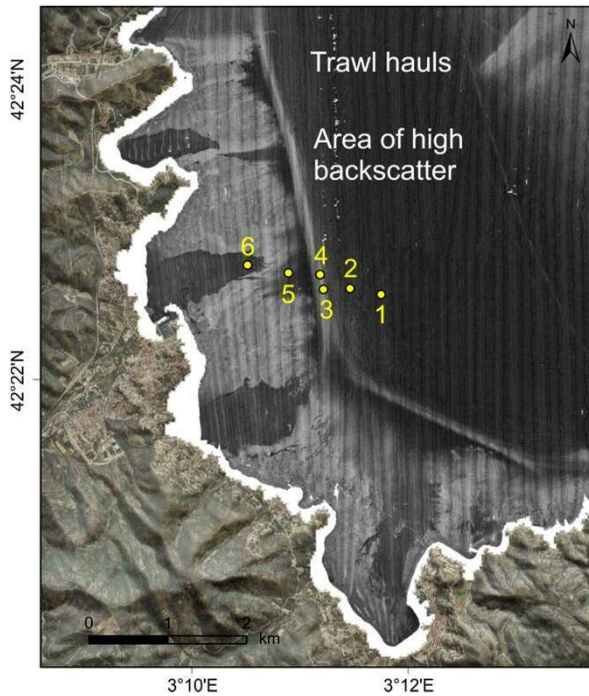


## Seafloor morphology



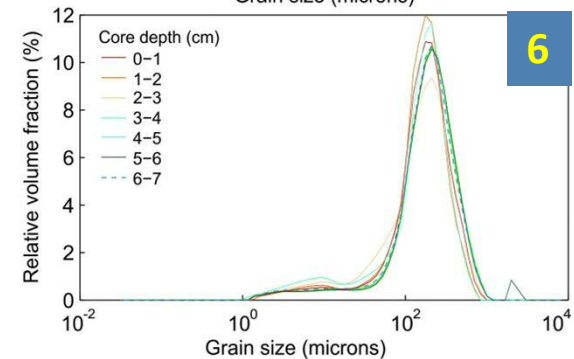
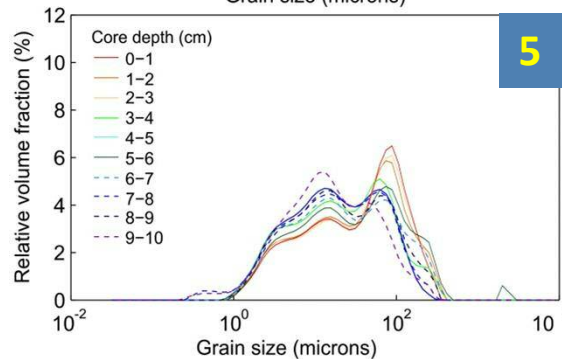
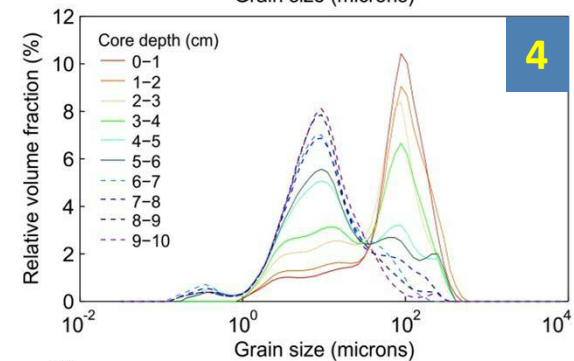
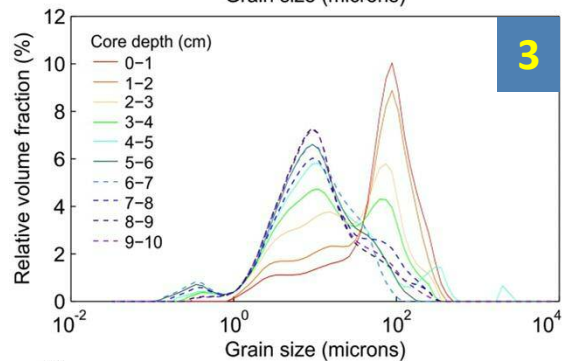
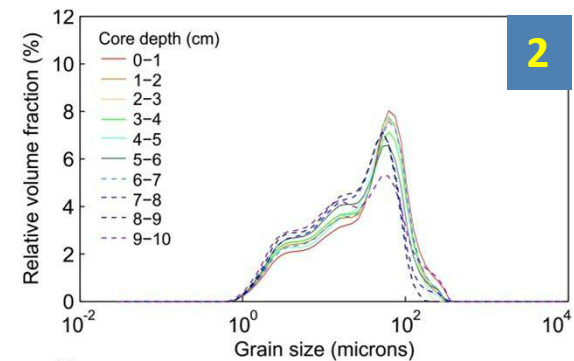
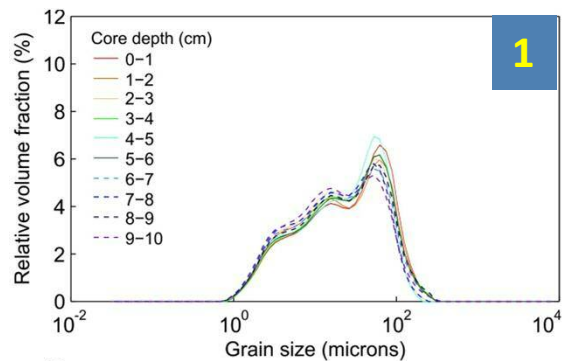
The high backscatter region appears in the bathymetric maps as an abrupt change in the mean seafloor gradient and locally with a narrow (50-150 m wide) slightly depressed (0.2-0.6 m deep) area.



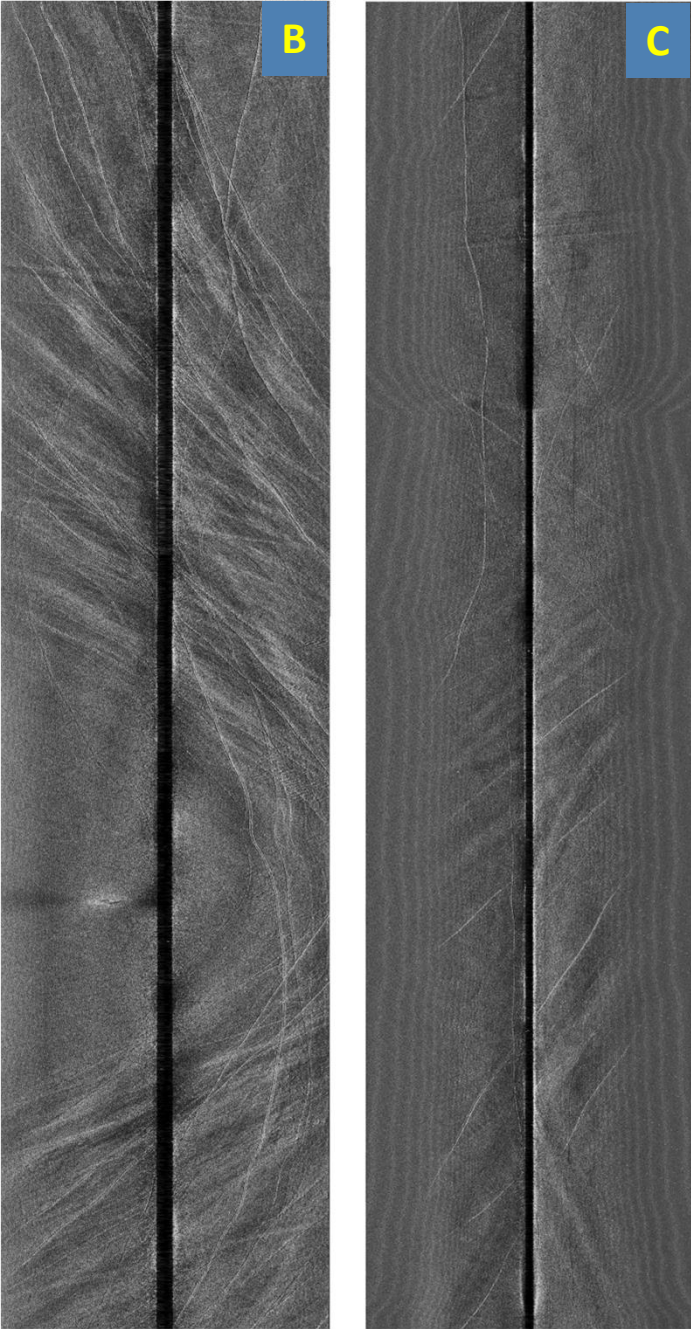
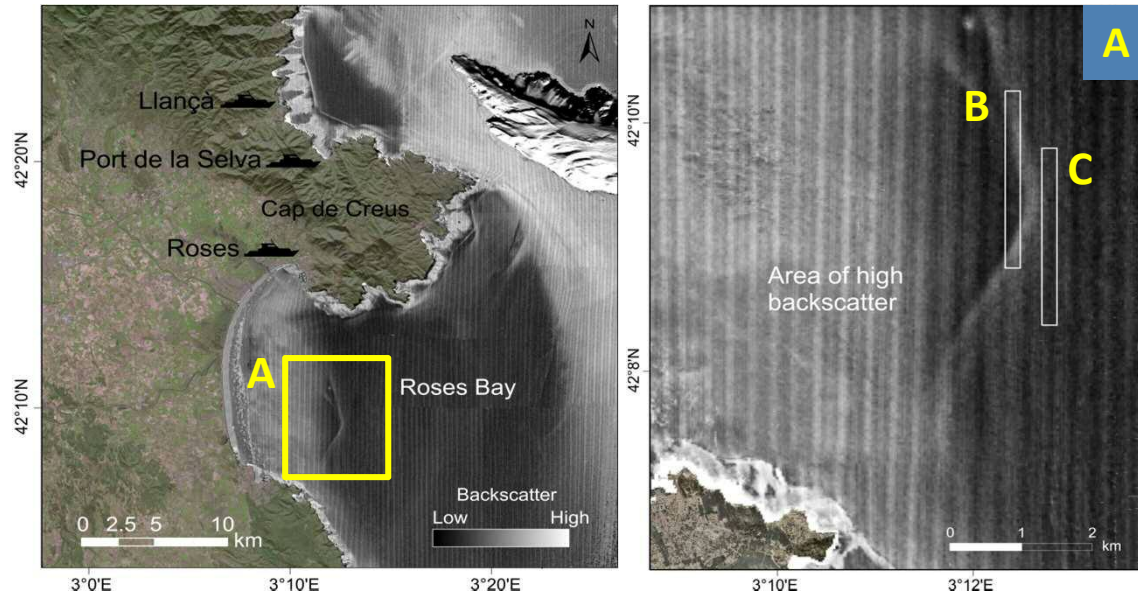


Sediment cores retrieved on the **area of high backscatter**, corresponding with the highest trawling intensity, display sediment **coarsening in the upper layers (0-4 cm)** caused by winnowing of finer fractions.

## Sediment information

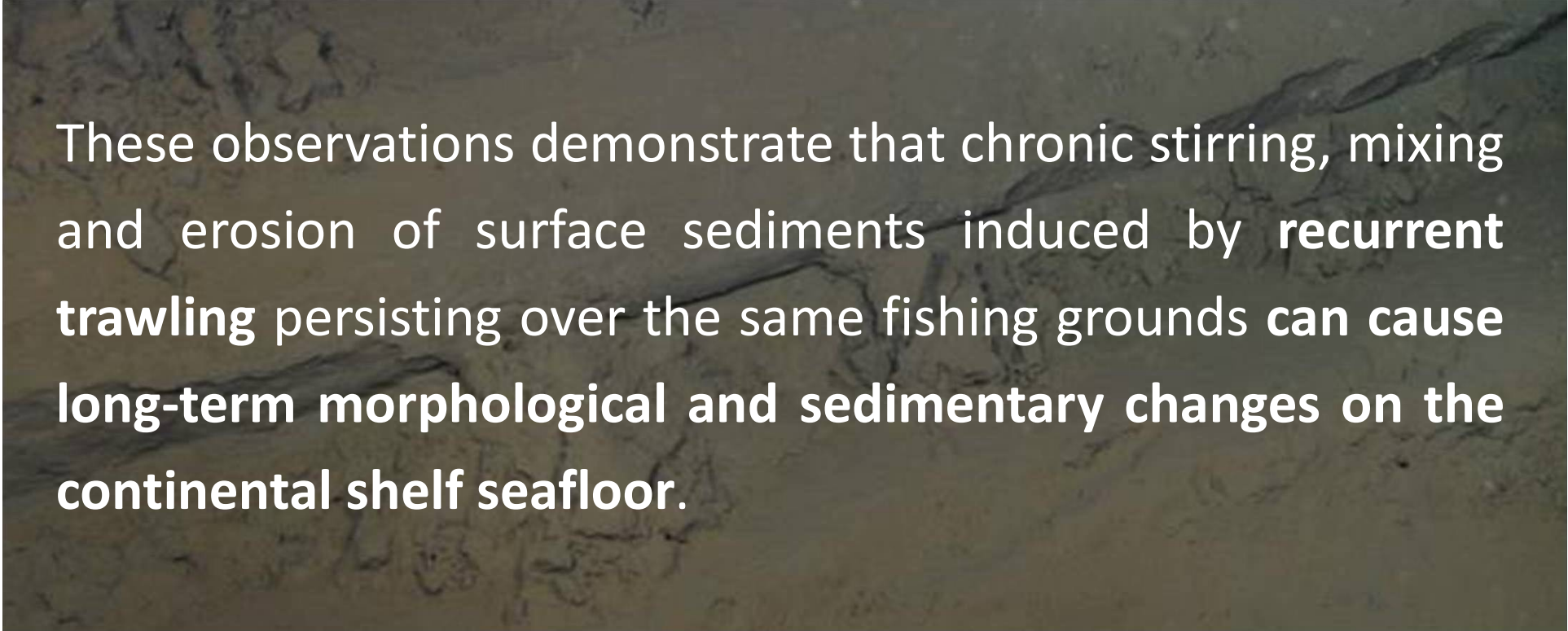


# Trawl marks



Side-scan sonar images illustrate areas of high density of trawl marks generated by fishing gears in the most heavily trawled regions (Fig. b) compared to low trawled regions (Fig. c).

## Findings



These observations demonstrate that chronic stirring, mixing and erosion of surface sediments induced by **recurrent trawling** persisting over the same fishing grounds **can cause long-term morphological and sedimentary changes on the continental shelf seafloor.**

## Acknowledgements

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