

CERES storyline - sardine and anchovy fisheries in the Mediterranean

Will small pelagisc be effected from climate change?

During the last 3 decades landings of small pelagics fisheries in the North Western Mediterranean have decreased significantly, due to environmental changes as well as to excessive fishing pressure in the early 1990s. Fisheries-independent abundance estimates of sardine (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*) mirror the decrease in fisheries landings. Additionally, scientific surveys of early stages (eggs and larvae) show increased abundance of the round sardinella (*Sardinella aurita*), a previously rare species in the area spreading from the south. All these lines of evidence suggest profound changes in pelagic ecosystems.

How vulnerable are small pelagics to climate change?

The decrease in the abundance of the traditional target species of small pelagic fisheries, sardine and anchovy, is having important effect on fisheries productivity. The purse seine fleet exploiting the resource in Spanish coasts, as well as the midwater trawl fleet operating in the French coasts, have suffered important reduction in

the number of fishing units to half of the former fleet size and the economic viability of the fisheries are uncertain. The increase in abundance of the round sardinella cannot mitigate the economic impact of productivity loss, as this species has very low commercial value.

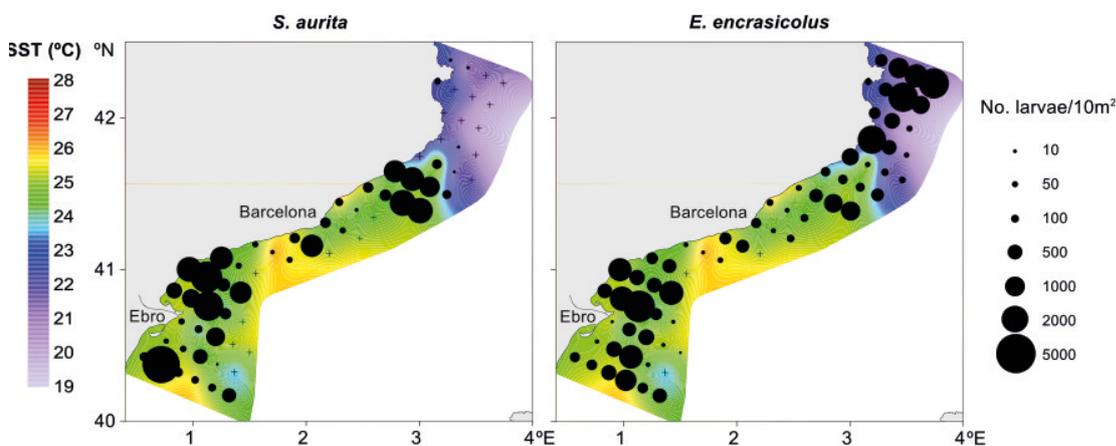
What is the economic value of this fishery?

The combined landings of sardine and anchovy in the early 1990s in Catalonia were ca. 50 000 t, for a total value of 100 M € approximately. In recent years, the combined landings are ca. 10 000 t with a value of 25 M€. The fleet size has likewise decreased in the 1993-2016 period, from 163 units to 82.

What are the challenges?

Current research shows that the productivity of these small pelagic fish stocks is negatively affected by increased temperatures, that reduce reproductive success in the winter spawning sardine. The summer spawning anchovy can be affected also by extreme temperatures, such as the anomalous hot summers of 2003 and 2006. Further

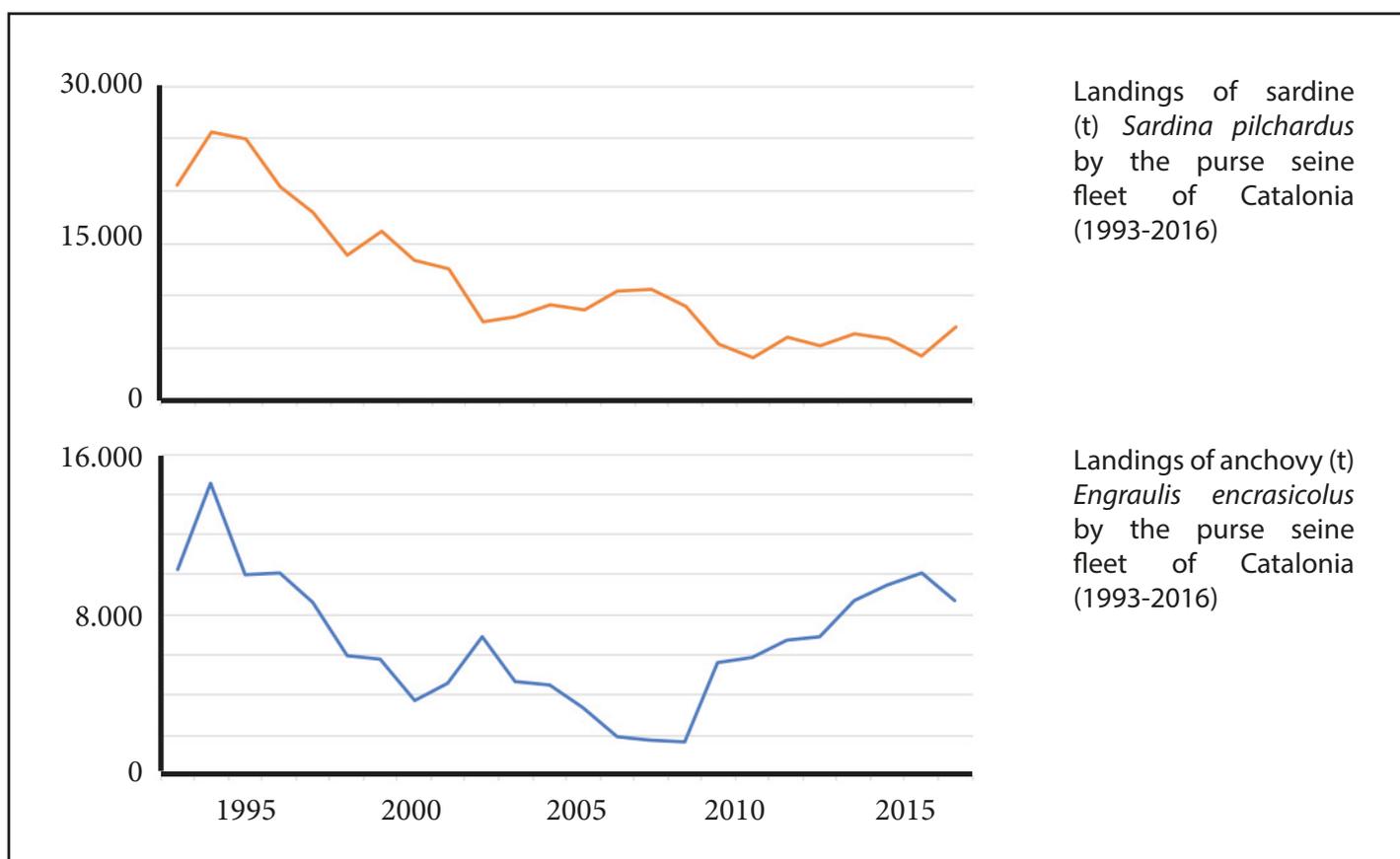
Larvae of round sardinella, *Sardinella aurita*, and anchovy, *Engraulis encrasicolus*, along the Catalan coast in summer



climate related impacts are suspected to be driving slow growth in sardine and anchovy, likely due to changes in the ocean's biological productivity.

What is the working program in CERES?

Statistical models will be used to determine the effect of climate changes on the early life stages of sardine, anchovy and round sardinella, as well as to relate these changes to decreasing fisheries productivity.



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