Map of phytoplankton concentration, the staple diet of sardines and anchovies.
Distribution curve of sardines and anchovies in the Humboldt Current

Where have the sardines gene?

South American sardines, once present in abundance, have disappeared. Will they return? Is it now the turn of the anchovy? To lift the veil on the mysteries surrounding these highly prized species, the CLS teams are bringing their experience in modelling to bear on a research project funded by the French National Research Agency, which is intended to help the Peruvian fisheries authorities manage this resource. Following on from tropical tuna, bluefin tuna, turtles and even swordfish, CLS experts are working on developing a behavioural model for sardine and nchovy populations. This model estimates the state of the population, based on parameters such as habitat for spawning, feeding and growth, but even on competition between the two species, effectively cannibalism!

The Humboldt Current (Antarctica, Chile and Peru) is one of the world's most abundant for fishing. This current takes up less than 1% of the world's ocean surface yet provides 15 to 20% of global catches. This area is affected by the famous El Niño phenomenon and longer range weather patterns. Thus the abundance or otherwise of sardine and anchovy populations ebbs and flows over decades. Yet since 2000 sardines have abandoned the area.

CLS experts in oceanography and marine biology are using a behavioural model for fish population to understand why. This model has already enabled a response to an enquiry from the SPC (Secretariat General of the Pacific Community) confirming the main trends in Pacific tuna resources, including those for bigeye tuna, which required measures to reduce the fishing effort.

These measures were taken in 2008 by the Western and Central Pacific Fisheries Commission (WCPFC).

Through research on anchovies and sardines, the model will be adapted to small pelagic fish. This model will show the development of an abundance of both species in the study area since 1960 depending on:
- environmental variations (current, temperature, oxygen...)
- fishing operations
- climate change (IPCC scenarios)
- and several biological parameters: habitat for spawning, feeding, growth, mortality rate, whether natural or caused by fishing, migration, competition between the sardine and anchovy populations, cannibalism, etc.

Ultimately, this model will enable the impact of future Peruvian fisheries administration measures regarding anchovies and sardines (projected fishing effort, etc...) to be assessed. It will provide invaluable assistance to fisheries administrations anxious to sustainably manage their marine resources and for the rest of us who enjoy eating them!

CLS IN FIGURES

21
the average number of parameters required to assess population behaviour

9
species modelled by CLS (tropical tuna, red tuna, swordfish, sardines and anchovies...)

330
staff

3
areas of operation

- sustainable resource management
- environmental monitoring
- maritime safety

3
specialist fields

- location
- collection of data
- ocean observation

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