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Major scientific questions

What scientific questions does EUR-OCEANS address?

On the one hand, we now have numerous evidences of strong links between key trophic levels of marine ecosystems and climatic fluctuations.

For example: from the fish catches recorded during the whole 20th century Francisco Chavez (Monterey Bay Aquarium, USA) showed that anchovies are abundant in the eastern Pacific when sea surface temperature are cold, and that sardines are abundant when warm waters dominate. The fluctuations of the sea surface temperature are directly related to climatic variations that we call the « Pacific Decadal Oscillation ».

Other example: in the North Atlantic, Gregory Beaugrand (now in CNRS Wimereux, France) in cooperation with scientists from the UK (Plymouth, Sir Alister Hardy Foundation) has shown that the variability of the distribution of pelagic crustaceans, that are food for fishes (cod, herring, etc...), is a function of the North Atlantic Oscillation. Those scientists also show that the migration to the north of cold water species is related to the on-going sea surface temperature warming.

On the second hand, we know that marine resources are already submitted to a drastic pressure caused by human activities:

Example: in the North Sea, it has been shown that the current biomass of fishes larger than 4 kg is only about 2.5% of its pre-trawling level, and the total biomass of all fishes is nearly 40% lower than it would have been in the absence of fishing.

Besides, Daniel Pauly (from the University of Columbia, Canada) has given numerous evidences of over fishing in the world ocean, as a whole.

This means that the world ocean catches cannot go much higher than the today total amount. In the beginning of the 21st century we have to face the reaction of the marine environment to global warming.

Therefore, the problem is: how the marine ecosystems, including exploited marine resources, will be affected by the global warming, and more generally by the anthropogenic pressures? Can we recommend solutions to policy-makers for a sustainable use of the marine resources? This is the major objective of EUR-OCEANS, which we want to achieve at the end of the 4-year contract with the European Commission.