

The water temperature in the subtropical Atlantic falls due to wind action

January 26 2011



This is the argo profiler. Credit: Argo-Spain

The temperature of water situated in the subtropical Atlantic experienced a drop of 0.15 C between 1998 and 2006. This has been revealed by a study led by the IEO (Spanish Oceanography Institute) which suggests that circulation caused by wind could be responsible for this "unusual" behaviour.

Whilst the [water temperature](#) in this area, situated along the 24.5° north parallel, from the African coast to the Caribbean, rose by 0.27°C between 1957 and 1998, researchers have recorded a drop of 0.15°C in the same area between 1998 and 2006.

"In the ocean there are very pronounced cycles of change, and therefore,

changes like those which took place in the coordinates analysed can reoccur in any location and at any time", Pedro Joaquín Vélez Belchí, main author and researcher for the IEO's Canarian Oceanography Centre, stresses to SINC.

According to the study, which was published recently in the *Journal of Physical [Oceanography](#)*, this phenomenon should not be linked to climate change. "The ocean's natural variability mechanisms are more significant than we thought", declares Vélez Belchí. The team is considering various hypotheses to explain the change in temperatures.

For the scientists, this cooling could be due to "circulation forced by the wind". "Changes in the global structure of winds in the north Atlantic cause oscillations on the ocean's surface layer which can be felt up to 2000 metres deep", the expert points out.

However, the scientists discard the hypothesis of thawing despite the fact that some water masses, originating in the Antarctic and the Mediterranean, have an influence in the area analysed. The temperature drop "should have been observed clearly in the areas close to the North Pole", maintains Vélez Belchí. And this was not the case.

The scientists measured the temperature and salinity of three oceanic layers: waters from the thermocline (300-800 metres), surface ocean (600-1800 metres) and intermediate waters (800-1.800 metros). The salinity recorded "similar" behaviour, as it is always linked to the temperature.

A new image of the ocean

The research team combined two methodologies: measurements using stations carried out from oceanographic research vessels, and the Argo network. With this network, consisting of 3000 indicators in all the

oceans, "a new image of the surface ocean" is obtained. Spain is taking part in the Argo-Spain programme.

Through the new system, the scientists developed synthetic sections for each year (carried out from the laboratory with data from the Argo network's buoys), and analysed the annual variability for 2005, 2006, 2007 and 2008. "Between 2006 and 2008 there were no significant changes", the scientist declares.

As part of the Expedición Malaspina 2010, the team will go on a new expedition to the same area in the coming weeks. "The work is pioneering in verifying how the Argo network can be of use for large-scale studies into oceanic variability", concludes Vélez Belchí.

More information: Pedro Vélez Belchí, Alonso Hernández-Guerra, Eugenio Fraile-Nuez, Verónica Benítez-Barrios. "Changes in Temperature and Salinity Tendencies of the Upper Subtropical North Atlantic Ocean at 24.58N". *Journal of Physical Oceanography*, Nov 2010. [Doi:10.1175/2010JPO4410.1](https://doi.org/10.1175/2010JPO4410.1)

Provided by FECYT - Spanish Foundation for Science and Technology

Citation: The water temperature in the subtropical Atlantic falls due to wind action (2011, January 26) retrieved 9 April 2024 from <https://phys.org/news/2011-01-temperature-subtropical-atlantic-falls-due.html>

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