

Red Sea may be cooling rather than warming, study finds

May 29 2019



KAUST researchers carry out detailed analysis of Red Sea data using KAUST Visualization Laboratory. Credit: King Abdullah University of Science and Technology

A recent study by Earth Scientists and Oceanographers at King Abdullah University of Science and Technology (KAUST) has revealed that surface temperatures in the Red Sea might be cooling, rather than rising.

"Analysis of long term data sets shows that the current high warming rates of the Red Sea appears to be a combined effect of global warming and natural long-duration changes in sea [surface temperature](#) (SST).

"Our study has revealed a sequence of alternating positive and negative trends in Red Sea [surface temperatures](#). Over the next decades, the trends indicate a cooling phase that may counter the effects of global warming," says Professor Ibrahim Hoteit, Associate Professor of Earth Science and Engineering.

Hoteit and colleagues in the Red Sea Modelling and Forecasting Group used KAUST supercomputer Shaheen II and state of the art equipment in the KAUST Visualization Core Laboratories to analyze over a hundred years of satellite data.

The data reveals how the Atlantic Multidecadal Oscillation (AMO) strongly influences surface temperatures in the Red Sea. Counter to global trends related to [climate change](#), the research points to a cooling phase over the next few decades.

"We found that the water in the Red Sea has a 70-year-cycle, the Red Sea is currently reaching the culmination of its 70-year-cycle. Our predictions show that temperatures in its waters will start cooling over the next 10 years, which goes against most expectations. In the next 30 to 40 years, the water temperature will continue decreasing but, in 70 years, it will start going up again, reaching another peak."

The research team drew upon satellite and [historical data](#) from both the U.S. National Oceanic and Atmospheric Administration (NOAA), The

National Aeronautics and Space Administration (NASA) and the U.K. Met Office. Collaborating institutions involved in the research, published in *Geophysical Research Letters*, included colleagues from the University of Athens as well as the Hellenic Centre for Marine Research.

NOAA describes the AMO as "an ongoing series of long-duration changes in the sea surface temperature of the North Atlantic Ocean." According to NOAA, the changes are "natural and have been occurring for at least the last 1,000 years."

The KAUST team's work shows that the long-term oscillation related to AMO has modulated the warming of the Red Sea over the past three decades, and, having reached its peak over the past decade, is projected to enter a negative phase in the following years, before warming up again 70 years from now.

"The AMO is a permanent feature of the Earth's climate system and is primarily associated with variations in the Atlantic conveyor belt," explained Hoteit. "The AMO has also been linked to important global climate impacts, such as the variation of mean surface temperatures in the northern hemisphere over several decades."

More information: George Krokos et al. Natural Climate Oscillations may Counteract Red Sea Warming Over the Coming Decades, *Geophysical Research Letters* (2019). [DOI: 10.1029/2018GL081397](https://doi.org/10.1029/2018GL081397)

Provided by King Abdullah University of Science and Technology

Citation: Red Sea may be cooling rather than warming, study finds (2019, May 29) retrieved 21 September 2024 from <https://phys.org/news/2019-05-red-sea-cooling.html>

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