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Europe's oldest lake traces 1.36 million years of climate

An international team of scientists lead by the OCCR reveals that Lake Ohrid in the South Balkans is indeed Europe's oldest lake. A study published in *Nature* shows that the lake came into being 1.36 million years ago.

Lake Ohrid lies at the border of Albania and North Macedonia and was supposed to be one of the earth's oldest lakes for some time already. Now, a scientific deep-drilling project comprising 47 researchers from 13 nations has confirmed this assumption. «We can prove that the lake was formed approximately 1.36 million years ago and has existed continuously since then», said geologist Hendrik Vogel, member of the OCCR and Institute of Geological Sciences. He was one of two co-leaders of the study published in *Nature*. “We were thrilled when we realised that we had drilled one of the longest and most complete lake sediment cores”, Vogel added. “Every climate researcher is dreaming of getting high resolution regional climate data going back more than 1.3 million years.”

The drilling took place in 2013 in water 245 metres deep and reached a maximum depth of 568 metres into the sediment. The extensive sediment succession allowed the researchers to reconstruct climate over the entire history of the lake in exquisite detail. By analysing sediment cores from the bed of Europe's oldest lake, the team has created a detailed climate history of the north-central Mediterranean and revealed the climate mechanism that has driven winter rainfall in the region.

Connection between the climate of the Mediterranean and tropical Africa

The study which was led by Hendrik Vogel from the University of Bern and Bernd Wagner from the University of Cologne was published in the prestigious scientific journal *Nature*. It is entitled „Mediterranean winter rainfall in phase with African monsoon during past 1.36 million years“. By providing an unprecedented understanding of the factors that have driven the Mediterranean region's climate in the past, the collected data will help scientists to model more accurately the region's future climate under global warming. Geochemical data and the pollen record show that winter rainfall increased in the north-central Mediterranean region during warm, interglacial periods. During these intervals, climate model simulations indicate increased cyclogenesis (the development and strengthening of low-pressure areas in the atmosphere) over the Mediterranean Sea particularly during late autumn leading to considerably higher rainfall.

The Mediterranean climate is characterised by dry summers and wet winters so winter rainfall is vital for the region's population and agriculture. "We discovered a positive phase relationship between the African monsoon and winter precipitation in the Mediterranean region, so between tropical climate systems and rainfall in the mid-latitudes thousands of kilometres away," said Hendrik Vogel.

"Whenever incoming solar radiation from the sun is enhanced in the northern hemisphere during summer you have this northward migration of the tropical climate system and we see increased rainfall in winter at Lake Ohrid. We see this mechanism consistently over the past 1.3 million years."

(Source: University of Wollongong, University of Cologne)

Publication

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