



Press Release
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Subtropical Arctic

The North Pole, synonymous with all things very cold, once had a subtropical climate according to scientists now returning from the Arctic.

The international scientific team, taking part in the Integrated Ocean Drilling Program's Arctic Coring Expedition, has just discovered that the Arctic Ocean once was ice-free because of prehistoric global warming.

The scientific team from eight nations recovered sediment cores from nearly 400 metres below the seafloor, in waters 1300 metres deep. "The early history of the Arctic Basin will be re-evaluated based on the scientific results collected on this expedition," says Professor Jan Backman, Stockholm University, one of the co-chief scientists.

The cores show evidence of subtropical, shallow seas in the form of tiny fossils—extinct marine plant and animals. These date back to a period known as the "Palaeocene-Eocene thermal maximum", a brief period that occurred around 55 million years ago characterized by an extremely warm climate that created a natural greenhouse effect, which caused massive carbon input to sea and air. Scientists identified the interval through specific algae, which lived only in subtropical conditions. The algae fossils reveal that the Arctic ocean once was much warmer—around 20°C (68F), similar to the waters around New York in August (NOOA) compared with today's freezing temperatures that average -1.5°C.

"We're seeing a mass extinction of sea-bottom-living organisms caused by these conditions" said palaeontologist Dr. Michael Kaminski, University College London, UK, on board the icebreaker Oden "Moving forward in time, we see many species disappear. Only a few hardy survivors endure the thermal maximum."

Prof Backman added that "we were also surprised to find fresh water conditions and periods of extreme warmth. This indicates environmental conditions were more variable than anticipated. We have now sediment records going back to 56 million years, which are resting on 80 million years old bedrock."

The expedition returns to Tromsø, Norway on September 14th. The scientists will meet again in November at the University of Bremen, Germany, to examine the data collected. Further study will help explain the changes in the Arctic's climate, from greenhouse conditions to today's icy environment.

The \$12.5M Arctic Coring Expedition is conducted under the auspices of the Integrated Ocean Drilling Program (IODP) by the European Consortium for Ocean Research Drilling. Scientists from a consortium of European scientific institutions, ECORD Science Operator, are responsible for fleet management, ice and weather monitoring, and science operations.

Notes to editors

1. Interviews can be arranged with any members of the scientific team. Please contact Owen Gaffney at the NERC Press Office, tel. +44 (0)1793 442629 or Andy Kingdon, British Geological Survey, e-mail: aki@bgs.ac.uk or telephone: +44 (0)115 936 3415 (office), +44 (0)7779 616 602 (mobile), or any of the contact persons below.
2. The Integrated Ocean Drilling Program (IODP) is an international scientific endeavour that supports basic research into the history of the ocean basins, the nature of climate change, the composition and structure of ocean crust and sediments and life that exists beneath the seafloor. IODP conducts technologically advanced ocean drilling expeditions which investigate regions beneath the seafloor that are inaccessible by any other technology. More information at: www.iodp.org.
3. European Consortium for Ocean Research Drilling (ECORD) represents and funds international ocean drilling at a European level. More information at: www.ecord.org
4. The British Geological Survey, BGS, is the world's first geological survey, formed in 1835. It is the nation's principal supplier of geoscience expertise and custodian of much of the country's geoscientific information. The BGS provides objective, impartial and up-to-date geoscientific information, advice and services which meet the needs of customers in the commercial, governmental and scientific communities of Great Britain and overseas, thereby contributing to the economic competitiveness of the country, the effectiveness of public services and policy, and quality of life.
5. NERC is the UK member of IODP. The Natural Environment Research Council (NERC) is one of the UK's seven Research Councils. It uses a budget of about £300 million a year to fund and carry out impartial scientific research in the sciences of the environment. NERC trains the next generation of independent environmental scientists. It is addressing some of the key questions facing mankind such as global warming, renewable energy and sustainable economic development.

6. More information concerning ACEX can be found at the expedition web site www.iodp.de. A logbook with reports and pictures can also be found on this page

For more information contact:

Albert Gerdes, University of Bremen. Email: agerdes@rcm-bremen.de or telephone +49 421 218-7761 (office), +49 172 43 77 986 (mobile)

Eva Grönlund, Swedish Polar Research Secretariat, e-mail: eva@polar.se or telephone: +46 703449251 (mobile), +46 86739730 (office)

Andy Kingdon, BGS, e-mail: aki@bgs.ac.uk or telephone: +44 (0)115 936 3415 (office), +44 (0)7779 616 602 (mobile)