

# Arctic ocean history is deciphered by ocean-drilling research team

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Sediment cores retrieved from the Arctic's deep-sea floor by the Integrated Ocean Drilling Program's Arctic Coring Expedition (ACEX) have provided long-absent data to scientists who report new findings in the June 21 issue of *Nature*.

A team of ACEX researchers report that the Arctic Ocean changed from a landlocked body of water (a 'lake stage') through a poorly oxygenated 'estuarine sea' phase to a fully oxygenated ocean at 17.5 million years ago during the latter part of the early Miocene era.

The authors attribute the change in Arctic conditions to the evolution of the Fram Strait into a wider, deeper passageway that allowed an inflow of saline North Atlantic water into the Arctic Ocean. Scientists believe that the deep-water connection between the northern Atlantic and Arctic Oceans is a key driver of global ocean circulation patterns and global climate change.

In 2004, the offshore ACEX research team cored a 428-meter thick sediment sequence from the crest of the Lomonosov ridge in the central Arctic Ocean, near the North Pole. These sediments provide the first geological validation of the Cenozoic paleoenvironmental history of the Arctic Ocean. Current evidence of the onset of the ventilated circulation system is preserved in the chemical and physical properties and the micropaleontology of the recovered seafloor sediments.

Co-chief scientist Jan Backman, Stockholm University, comments on the

significance of the new findings, saying, “If we can learn what has happened in the geological past, we can begin to use that knowledge to look into the future. Scientists engaged in climate change studies are advancing an important area of knowledge about the planet we live on.”

Source: Integrated Ocean Drilling Program Management International

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