



Media Release

Sea-Level Change in the Icehouse World

First results of the IODP New Jersey Shallow Shelf Expedition

Bremen, November 27th, 2009.

Since November 6th, 25 scientists from 11 countries have analyzed more than 1.3 kilometres of sediment cores which were drilled this summer during an expedition of the Integrated Ocean Drilling Program (IODP) in the shallow coastal waters off New Jersey. The first results of the investigations were presented during a media conference which took place on Friday, November 27th in the IODP core repository at the University of Bremen/Germany.

“We recovered a nearly continuous record of Earth history from 14 to 35 million years before present”, says Prof. Gregory Mountain, geoscientist at Rutgers University in New Jersey and one of the two co-chief scientists of the New Jersey Shallow Shelf project. “All in all we drilled 1,311.4 metres of sediment at three locations 45 to 65 kilometres off the coast of New Jersey where the longest borehole reached a depth of more than 756 metres below the sea floor”.

These sediment cores enable us to measure the magnitude, age, and rate of global sea-level change during a former “icehouse world” when, like today, ice sheets periodically covered and melted in Antarctica. Closer inspections in the Bremen laboratories have revealed both remnants of ancient sandy beaches and continental soils, indicating sea-level changes of as much as 100 metres. The scientists have identified about ten cycles of sea-level rise and fall with drastic seaward shifts of the shoreline during the interval between 14 and 35 million years ago.

“To our great surprise we came across thick freshwater lenses at all three drill sites as deep as 400 metres below the sea floor”, says co-chief scientist Dr. Jean-Noël Proust, University of Rennes, France. The freshwater fills the microscopic spaces between the silty clay and sand layers at that depth. “It is especially surprising that these freshwater laden layers are more than 100 metres thick. Further research will tell us more, but we think that these freshwater lenses, which

are today 50 kilometres offshore, originated more than 12,000 years ago during the last ice age, when sea-level was much lower and the New Jersey shoreline was occasionally seaward of our three drill sites.”

The coastal waters off New Jersey are particularly well suited for sea-level research: two major rivers flushed large amounts of sediment from land into the coastal Atlantic Ocean, a process that provides a detailed archive of the Earth`s history. The region is also tectonically stable: rising and sinking of the North American plate does not affect natural sea-level changes. Finally, the drill sites were located in the middle of the New Jersey shallow shelf, which guaranteed that the record of both rises and falls of sea-level are recorded in the sediments.

This phase of laboratory investigations will end on December 5th. During the following months, a further 14,000 samples taken in Bremen where the cores were split during the Onshore Science Party will be analyzed at the laboratories of the scientists involved in the expedition.

The New Jersey Shallow Shelf (NJSS) Expedition is a contribution of the European Consortium for Ocean Research Drilling (ECORD) to the Integrated Ocean Drilling Program (IODP), a multinational scientific program involving 24 countries, including 16 European nations. The expedition was also supported by the International Continental Scientific Drilling Programme (ICDP).

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