

Using Stable Isotope Analysis of Foraminifera to Reconstruct Past Climate and Ocean Circulation on the Deep Iberian Margin (110 – 140 ka)

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The AMOC, or the Atlantic Meridional Overturning Circulation, is a series of ocean currents that pass through the Atlantic Ocean and affect several factors including global heat distribution and rainfall, as well as sea level along the eastern coast of the United States. With recent research by the IPCC suggesting that the AMOC will weaken over the next century, we looked towards the past to understand how past climate change has correlated with ocean circulation strength, particularly in the North Atlantic Deep Water (NADW), due to its importance in regulating heat on the global scale. With IODP Expedition 397, holes were drilled into several sites off the coast of the Iberian Margin, including site U1587, for the purpose of collecting sequential deposit data on areas of high sedimentation rates. We utilized fossilized benthic foraminifera from site U1587, particularly *Cibicides wuellerstorfi*, as a proxy for the past climate and ocean circulation strength on Earth, by analyzing their stable isotope ratios ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$). Our results indicate that from 129 – 138 ka (MIS 6), the climate was colder, there was likely more ice volume on Earth, and there was a weaker ventilation of NADW at this site. During the intervening deglaciation (125 – 129 ka), there was some warming on Earth and the NADW ventilation became significantly weaker early on, and then strengthened afterwards. Then, our findings show that from about 115 – 125 ka (MIS 5e), the Earth continued to get warmer, and NADW ventilation was generally strong. Lastly, the results support that from 113 – 115 ka (MIS 5d), the Earth's climate had started to trend colder and NADW ventilation had begun to weaken. These results provide additional insights into the connection between AMOC and the climate.