Holocene Changes in the East Basin of the Deep Atlantic Ocean

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With the threat of rising temperatures, the Atlantic Meridional Overturning Circulation (AMOC) has been predicted to slow down or stop entirely, potentially exacerbating climate dysregulation in the Atlantic region. This project looks to the geologically recent past, to examine how much and in what way Atlantic ocean circulation has fluctuated over the last ~10,000 years. From IODP expedition 397, we processed 33 samples from site 1586, the sediment core at the greatest depth from the Iberian Margin. Stable isotope analysis of benthic foraminifera microfossils found in these sediment cores is a widely used technique for reconstructing past ocean circulation patterns; $\delta^{13}C$ is a tracer for water masses, and $\delta^{18}O$ is a proxy for sea temperature and land ice coverage. We searched specifically for *Cibicidoides wuellerstorfi* foraminifera and used mass spectrometry to find their values of $\delta^{13}C$ and $\delta^{18}O$ throughout the time-series. Our analyses of the stable isotopes generally indicate a warm climate and strong AMOC activity throughout the Holocene. Within the time interval 3.5-2.4 ka, stable oxygen isotope analysis shows a deep water temperature change from warmer to colder conditions. The lowest $\delta^{13}C$ value occurs within that time interval; after $\delta^{18}O$ values dropped at 3.5 ka, and gradually started increasing, the $\delta^{13}C$ decreased significantly at 2.8 ka. The fact that the lowest $\delta^{13}C$ value coincides with a 1,000 year period of deep water temperature change shown in the $\delta^{18}O$ record suggests a link between climate change and AMOC activity in the past, and supports predictions for the impact that current climate change may have on AMOC in the future.