How did the Mediterranean Outflow Vary in the Last 30,000 Years?

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The highly saline outflow water exiting the Mediterranean Sea, called Mediterranean outflow water (MOW), may play an important role in increasing the salinity of the Atlantic Ocean. Its current speed is predicted to have changed over the last 30,000 years as a result of changes in Earth's climate. The transition from the glacial to interglacial period affected numerous aspects of Earth's climate including ocean circulation in regard to its density, speed, salinity, etc. Sediment grains deposited along the ocean floor beneath a flowing current may be used to characterize the speed of that ocean current in the past. By examining the grain size of sediments beneath the MOW in regions where the current flows today, we can make inferences about how past climate affected the MOW current velocity. The Holocene, which ranges from approximately 11,500 years ago to the present, is recorded to have several periods of rapid climate change. We studied Site U1588 (37.96˚N, 9.52˚W, 1339 meters below sea level) of the International Ocean Discovery Program (IODP) Expedition 397 on the Iberian Margin through analysis of sediment grain size and isotopic analysis of the benthic foraminifera, *Cibicidoides wuellerstorfi*. Using a preliminary age model and samples separated into 10-63 μm, 63-150 μm, and >150 μm size ranges, we examine the variability in grain sizes over the last 30,000 years. Using a microbalance, we were able to collect % fraction of both 63-150 μm and >150 μm in each sample. Using a SediGraph semi-automated grain-size analyzer, we were able to obtain the proportion of sortable silt, the sediment grain size ranging between 10-63 μm. Our results reveal that the Holocene interglacial period experienced a general trend of increased grain size compared to the preceding glacial interval. Of the multiple peaks in our data, we observe a consistent shift in the percentage of larger grain-size distributions within the first half of the Holocene, 5,000-10,000 years ago. Along with the coarsest grain-size categories, we suggest an opportunity to further investigate this trend with the collection of additional data within the sortable silt (10-63 μm) grain size.