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ENHANCED MERCURY DYNAMICS IN NORTHEASTERN BRAZIL DURING THE NORTH ATLANTIC COLD EVENTS OF THE LAST GLACIAL-INTERGLACIAL CYCLE

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Mercury is a highly volatile, toxic metal with a long residence time in the atmosphere and globally transported from point sources to remote locations. Mercury archives in sediment cores store paleoclimatic and paleoceanographic information and is useful in the reconstruction of paleo-dynamics. Despite its extensive use in paleoclimatic studies, there is limited knowledge on the influence of major climate change drivers on the mercury biogeochemical cycle. Consequently, an understanding and prediction of the element's dynamics in an environment driven by simultaneously acting climate drivers of atmospheric and oceanographic circulations is still lacking.

This study aimed to understand the impact of oceanographic and atmospheric circulations on the mercury biogeochemical cycle and if its variations are associated the global climate change over the last Glacial-Interglacial cycle. Total Mercury, bulk and XRF analysis in ocean sediment core GL-1248 collected from the continental slope of northeastern Brazil and dated to 128Kyr shows responses to past periods of global climate change. Mercury records are exceptionally high in sediments of the Glacial Period of Marine Isotope Stage (MIS) 4 and 3 ranging between 50.2ng/g and 68.37ng/g. The NGRIP dust concentrations and our Br record (proxy for Atmospheric Mercury Depletion Events) shows significant correlation with Hg concentrations thus suggestive of the generation of Hg depletion events.

Elevated Hg values in MIS 5 cold sub-stages are coincident with periods of sea level low-stands that contributed to the eroding of the continental shelf and the high fluxes of terrigenous material delivery to our site as evident by the Fe/Ca ratios. Similarly, increased Hg values co-vary with high-resolution Fe/Ca peaks that occur due to increased precipitation over northeastern Brazil during Henrich Stadials. Correspondingly, while wavelet co-variance analyses indicate a continental source of mercury, millennial-scale cycles were observed in the spectral analysis. Based on the results, we propose that Hg variations in our sediment core do not entirely reflect atmospheric deposition, but rather shows but a superimposition of global and continental Hg sources which are determined by changing climate effects that are subject to North Atlantic Cold Events.

Session No. 256--Booth# 159

T122. Oceans and Climates through Earth History: From Proxy Reconstructions to Model Assessments (Posters)
Wednesday, 7 November 2018: 9:00 AM-6:30 PM

Halls J-K (Indiana Convention Center)

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