Amazon 10kyr: from the past climate to future challenges

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The Amazon Basin, comprising 7.5 million km^2 plays a key role in the global climate system, acting as a major component of the South American Monsoon System (SAMS), coupling the Intertropical Convergence Zone (ITCZ) to the South Atlantic Convergence Zone (ZACS). It is an important player in the moisture source for the tropics and sub-tropics in the South Atlantic Sector, recycling the water through the vegetation and surface soil, and contributing to the hydrological cycle of the Andean high mountains. Its evolution along the Holocene is still an issue of debate with inconclusive hypotheses about the evolution of the forest and its biodiversity. An important dry event (or megadrought) that took part during the mid-Holocene in the Amazon basin has been a matter of interest for paleoclimatologists. Although well recognized in models and in a few climate proxies, the major natural actors behind this episode are not completely described in the literature, probably due a lack of high resolved paleoclimate records in the context of the vast continental Amazonian land domain. More comprehensively, authors attribute the nature of the wet and dry phases of the Amazon Basin to the latitudinal shift of the ITCZ, according to warming periods in the North Hemisphere. In this presentation, I will discuss the results of new proxy data compilations that clarify better the mid-Holocene drought event and its duration manifested in different geochemical proxies as well as the timings with respect to other databases from the Andes and the Atlantic Ocean. We demonstrate that the Amazon megadrought left significant imprints in the Andean ice and Amazon and La Plata water river discharges. We estimate that the Amazon megadrought lasted between 1.5 and 2.0k years in a 10kyr time scale and seems to be related to the North Hemisphere Holocene Climate Optimum. Coupling the climatic and the regional archeological data, the establishment of the mid-Holocene Amazon drought may support the hypothesis of a climatic cause for the early man migrations and exodus in the Eastern South America at that time.