Geophysical Research Abstracts, Vol. 8, 10012, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10012

The Holocene history of the wadi Tanezzuft (Libyan Sahara): response of fluvial landforms to incoming aridity

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The wadi Tanezzuft is nowadays an inactive fluvial valley located in the SW Fezzan, an hyperarid region of the Libyan Sahara. During the wet Holocene (11-5 Kyr BP) the Tanezzuft valley was an endorheic river, which ended in a large delta system located some 200 Km northward from its catchment basin, close to the dune of the Ubari sand sea. In the same period it fed through a secondary branch the lake of Garat Ouda (some 80 Km2 wide) and was inhabited by human communities. At the onset of arid conditions at 5 Kyr BP the terminal delta and the Garat Ouda basin dried out. Moreover, the main river reduced its length of an half and changed its sediments from a gravel to a silt dominated deposit. However, water availability persisted for several millennia, probably due to its wide catchment basin, and it gave origin to a oasis; at around 1.5 Kyr BP the oasis system collapsed and it was separated into several minor oasis still existent in the area. Detailed reconstruction of the geomorphological changes in the wadi Tanezzuft area were obtained through the study of high resolution satellite imagery and of a complete field survey and dated on the base of the archaeological record and of hundreds of 14C dating.