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Characteristics and historical development of fluvial sediments in the UAE

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Fluvial deposits in the United Arab Emirates include a wide range of different lithologies and textures ranging from wadi and alluvial fan gravels, sands, silts and clay of different morphology, structures and cementation degree. These deposits represent vital economic, cultural and environmental resources in the UAE. In addition to their direct utilization in the industry as construction materials, agricultural ground and more, they are significant groundwater reservoirs (aquifers) and provide space for landfills and waste disposal. Here we present, field data coupled with geomorphologic observations and Be-10 and C-14 analyses of alluvium wadi deposits and related terraces located in the north and north-eastern parts of the UAE. The study area is strongly affected by the obduction of Oman ophiolite and subsequent tectonic activities during the late Cenozoic times. Deep incised valleys cut through the mountain ranges and deposit a mixture of gravel to clayey sediments that commonly reach a thickness of up to 30 m, but thicker sections were also encountered in scattered places. Alluvial-related terraces are developed inland and along the sea shore where deposition seems to have been interrupted by either riverine or marine peneplaination. In addition to carbonate and ophiolite dominated lithologies in the alluviums, some clay minerals and cementation by gypsum and anhydrites is found. Results of Be-10 and C-14 measurements of the clay-silt matrix and selected carbonates will be presented in relation to dating and paleoclimatic events.