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Natural emergence of creeks and watercourses in the Rio Quinto basin, Argentina

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The Rio Quinto basin covers approximately 35,000 km2, and constitutes one of the most important water resources for the Midwest of Argentina. Agriculture irrigation and water supply for urban centres is directly dependant on the hydrological processes occurring in the basin. Despite its importance, there are still a number of uncertainties about the system and the mechanisms that trigger gully erosion, and the rapid generation of watercourses in the region. The emergence of surface waters not only alters the hydrological regime, but has catastrophic consequences for property and infrastructure. Observations suggest that the formation of a new drainage system would be controlled by multiple factors such as the topography, geological setting, soil composition, and climate change. In this regard, some watercourses might have exploited older gullies and developed over a pre-existent fluvial system. Additionally, the initiation of a precipitation cycle of particular intensity could be accounted for the increase in erosion rates after 2005. Once gullies develop, the area becomes more susceptible to soil degradation. High sodium and the predominance of fine-grained materials would enhance pipe flow, causing an additional reduction in the soils strength. The hydrological system would not have reached equilibrium yet. Therefore, the stream network is expected to enlarge over time. Results of the study contribute to better define the location of areas vulnerable to soil denudation, and constitute a useful tool for early warning and mitigation of natural disasters in the agricultural regions of Argentina.

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New insights on the stratigraphy of Tobroq-Burdi Area, Al Jabal Al Akhdar, Ne Libya

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The stratigraphy of the eastern region of Libya (called Tobroq-Burdi) has been stratigraphically reviewed. Three surface exposures, Wadi al Hash, Wadi al Shaigh and Wadi al Rahib have been measured, sampled and analyzed using both the lithology and the paleontology with particular emphasis on foraminifers. Previous works in the area have been revised to sort out the contradiction on the stratigraphy. A well-known transgressive event (i.e. glauconitic bed) has been observed at the basal part of the Al Faidiyah Formation confirming the long term disconformity surface separating Upper Oligocene Al Faidiyah Formation from the underlying Middle Eocene Darnah Formation at Wadi al Hash and Wadi Al Shaigh sections or from the underneath Campanian Al Majahir Formation at Wadi al Rahib section. Furthermore, the extensive spatial distribution of the Al Faidiyah Formation as well as the overlying Al Gaghbub Formation in all studied sections indicate a relative stability of the area and the thickness variation is attributed to the paleorelief of the area. On the basis of Foraminifera assemblages, the Darnah Formation is Middle Eocene, Al Faidiyah Formation is Late Oligocene, Al Gaghbub Formation is Middle Miocene in age at Tobroq-Burdi area. In the present study, the term Al Khowaymat Formation is replaced by Darnah Formation instead of the Lower Member of Al khowaymat; while, Al Faidiyah Formation instead of the Upper Member of Al Khowaymat at the western studied sections. Similarly, the term Lower Member of Al Khowaymat Formation is replaced by Al Majahir Formation at Wadi al Rahib section. The outcrop of Al Majahir Formation in the Wadi al Rahib section is explained as a newly introduced "Burdi plunged anticline" with a trending axis NE-SW, it is linked to the Cyrenaican orogeny as indicated by the reported angular unconformity with the overlying Tertiary rocks. A Dextral strike slip fault dislocated the Burdi plunge anticline is proposed and is considered as the main reason for the limited cretaceous areal distribution at the coast.

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