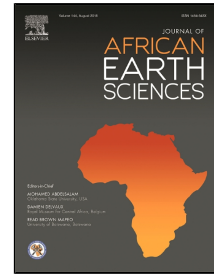


# Accepted Manuscript

Distinguishing rift-related from inversion-related anticlines: Observations from the Abu Gharadig and Gindi Basins, Western Desert, Egypt.

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PII: S1464-343X(18)30158-4  
DOI: 10.1016/j.jafrearsci.2018.06.004  
Reference: AES 3230  
To appear in: *Journal of African Earth Sciences*  
Received Date: 22 June 2017  
Accepted Date: 05 June 2018

Please cite this article as: Mohammad Abdelfattah Sarhan, Richard E. LI. Collier, Distinguishing rift-related from inversion-related anticlines: Observations from the Abu Gharadig and Gindi Basins, Western Desert, Egypt., *Journal of African Earth Sciences* (2018), doi: 10.1016/j.jafrearsci.2018.06.004

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1        **Distinguishing rift-related from inversion-related anticlines:**  
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11  
12 **Abstract**

13 Distinguishing the tectonic origin of anticlinal structures is problematic in regions with a  
14 complex history of rifting and inversion. We present the results of seismic mapping, in the  
15 form of time-depth (isochron) and time-thickness maps to characterize how sedimentary  
16 thickness differentials evolved in response to normal faulting and to inversion events on faults  
17 within the Abu Gharadig and Gindi Basins in the Western Desert of Egypt. Late Cretaceous  
18 rift-related faults in the Abu Gharadig Basin strike NW-SE, W-E and SW-NE. In the eastern  
19 part of the basin, a prominent SW-NE trending interbasinal saddle formed in response to  
20 preferential subsidence forming half-grabens to its north-west and southeast, during the Mid-  
21 Turonian to Santonian interval. Santonian to Palaeogene inversion in the Abu Gharadig Basin  
22 developed on its northern basin margin, the absence of SW-NE striking faults in the eastern  
23 central basin resulting in any inversion effects being minor. In the central Gindi Basin, Upper  
24 Cenomanian to Lower Turonian SW-NE striking rift faults underwent inversion as early as  
25 the Mid-Turonian. The orientation of existing rift faults and modification of the local stress  
26 fields control the extent to which inversion was taken up in each basin through time. The Abu  
27 Gharadig and Gindi Basins are two of the rift basins developed in West and Central Africa  
28 that underwent rifting, inversion and dextral shearing during the Late Cretaceous. We  
29 emphasize the value of high-resolution stratigraphic mapping to characterize short-lived and  
30 subtle pop-up events that may have gone unnoticed.

31  
32 **Keywords:** Anticlines - Rifting – Inversion tectonics - Abu Gharadig Basin - Gindi Basin.

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