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Role of pre-extensional tectonics and anisotropy on rifting and drifting in the Georges Bank - Nova Scotia - Morocco Atlantic segment; controls on petroleum systems

Studies of the Boujdour Reconnaissance Permit, Morocco are based on magnetic, gravity, seismic and geological data from Morocco and the conjugate American margin. The curvilinear late Paleozoic orogen affected the location of the central Atlantic syn-rift faults. NE-SW striking thrust faults were reactivated as normal faults, whereas prominent curvatures, such as the Pennsylvania salient, introduced structural complexities. ENE-WSW striking dextral transpressional strike-slip faults of this salient became reactivated during the Carnian-Toarcian rifting due to low friction. They formed sinistral transtensional strike-slip ?rails? that prevented the Georges Bank-Tarfaya Atlantic segment from orthogonal rifting, resulting in the pull-apart basin system. Basins to the south and north of this segment underwent almost orthogonal rifting. ?Rails? lost their function after the continental break-up. They were not kinematically linked to younger oceanic fracture zones.

Atlantic segments initiated by almost orthogonal rifting differ from the connecting segment initiated by Georges Bank-Tarfaya sinistral transfer zone. These contain NE-SW striking normal faults, Upper Triassic-Lower Jurassic evaporites and salt-detached gravity glides, whereas the connecting segment does not. NW-SE striking oceanic fracture zones kinematically linked with continental faults controlled reservoir rock transport pathways across the extensive uplifted continental margin.

The connecting segment contains numerous small depocenters. Their boundaries are formed by ENE-WSW striking sinistral strike-slip, NNE-SSW striking normal and WNW-ESE striking dextral strike-slip faults. Reservoir transport pathways extended through local depocenters.