

4. Early Cretaceous Carbonate Play

Overview:

The Early Cretaceous carbonate play is characterized by positive features identified as isolated carbonate platforms situated above the Namaqua High. Several prospects within this play have been identified in the north and central parts of the Orange Basin, and along the entire Namibian margin. Notably, no carbonates have been encountered at this stratigraphic level in any of the inboard wells. The closest penetration to this level is observed in Moosehead, a well drilled in southern Namibia in 2013.

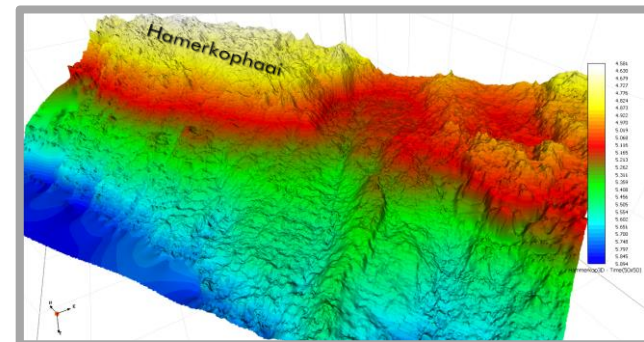
The interpretation suggests that the carbonates in this play developed during the post-rift "early drift" phase, on low relief SDR high in shallow water. The growth of these carbonate platforms ceased in the Lower Aptian when the basin was flooded, causing the carbonates to be submerged.

The source likely charging the reservoirs within this play is the proven Barremian-Aptian restricted marine source rock. It is widely spread throughout the Orange Basin, displaying some thickness variations across eastern and western depocenters. Source rock quality improves towards the deep water within the western depocenter as proven by the recent Namibian oil discoveries which yielded high quality light oil from the Aptian source rock. The extent and distribution of the source rock are currently unclear.

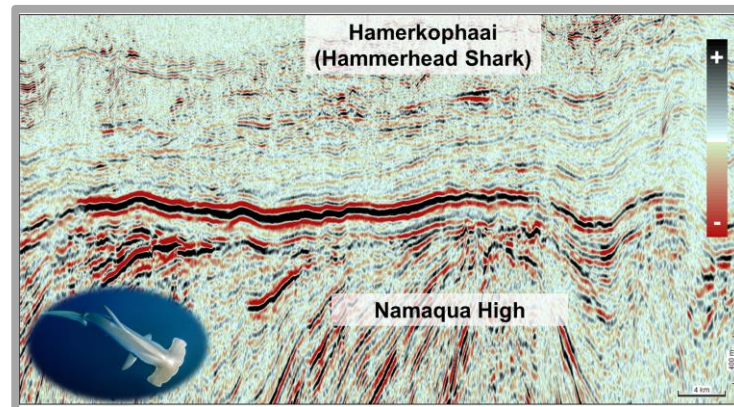
Reservoir may also be charged by possible Barremian and older synrift source rock within the eastern depocenter.

Exploration Opportunities

Several prospects can be seen on seismic data in the north and central parts of the basin. What makes it attractive is that some of these carbonates can be targeted as secondary targets below the "Graff" analogue sub-thrust prospects.

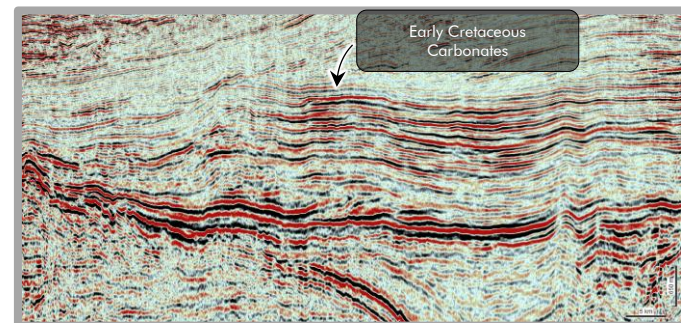


The Hamerkop prospect offshore South Africa (Fielies et al., 2024)

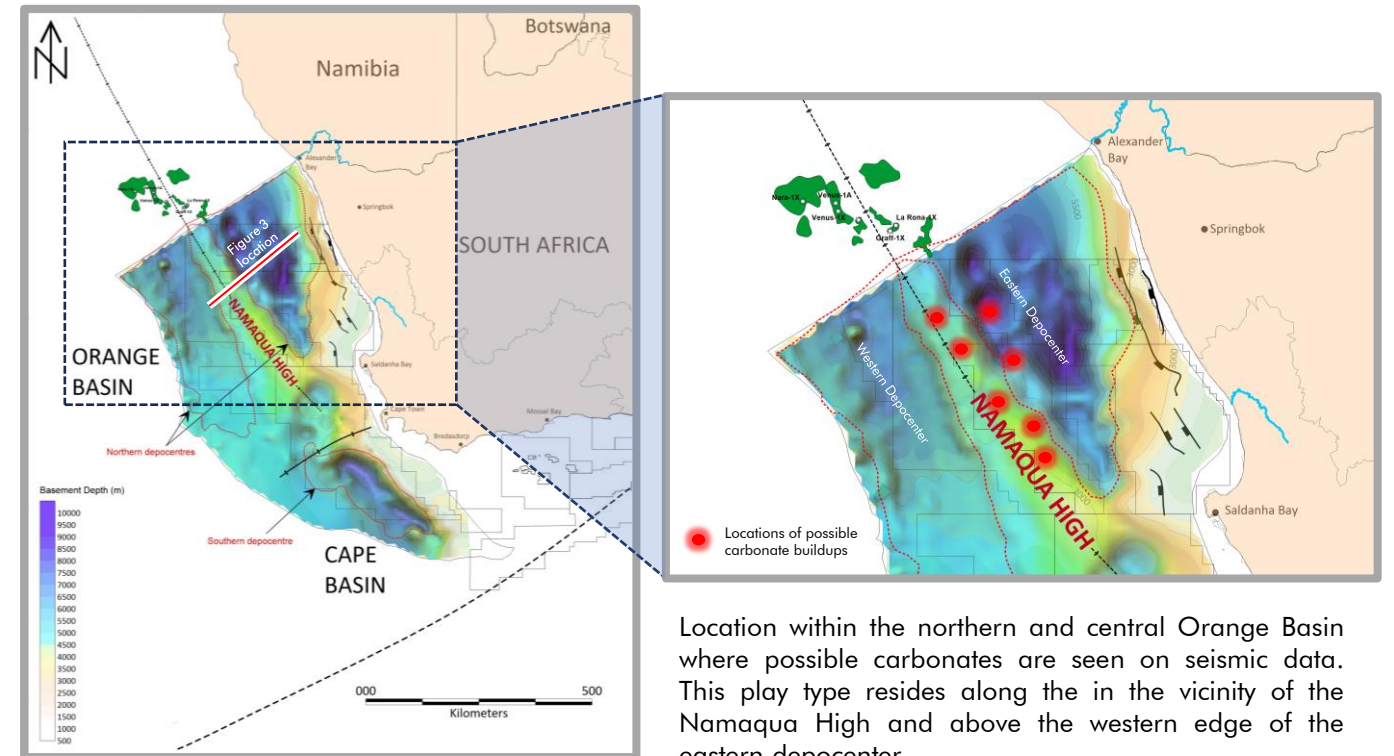


The Hamerkop prospect is thought to be a carbonate buildup overlying the Namaqua High. Mapped on 3D, it is likely carbonate in nature. Its estimated thickness ranges between 25 and 100m

Other Early Cretaceous carbonate buildups can also be recognized above the Aptian source rock interval over the eastern depocenter.

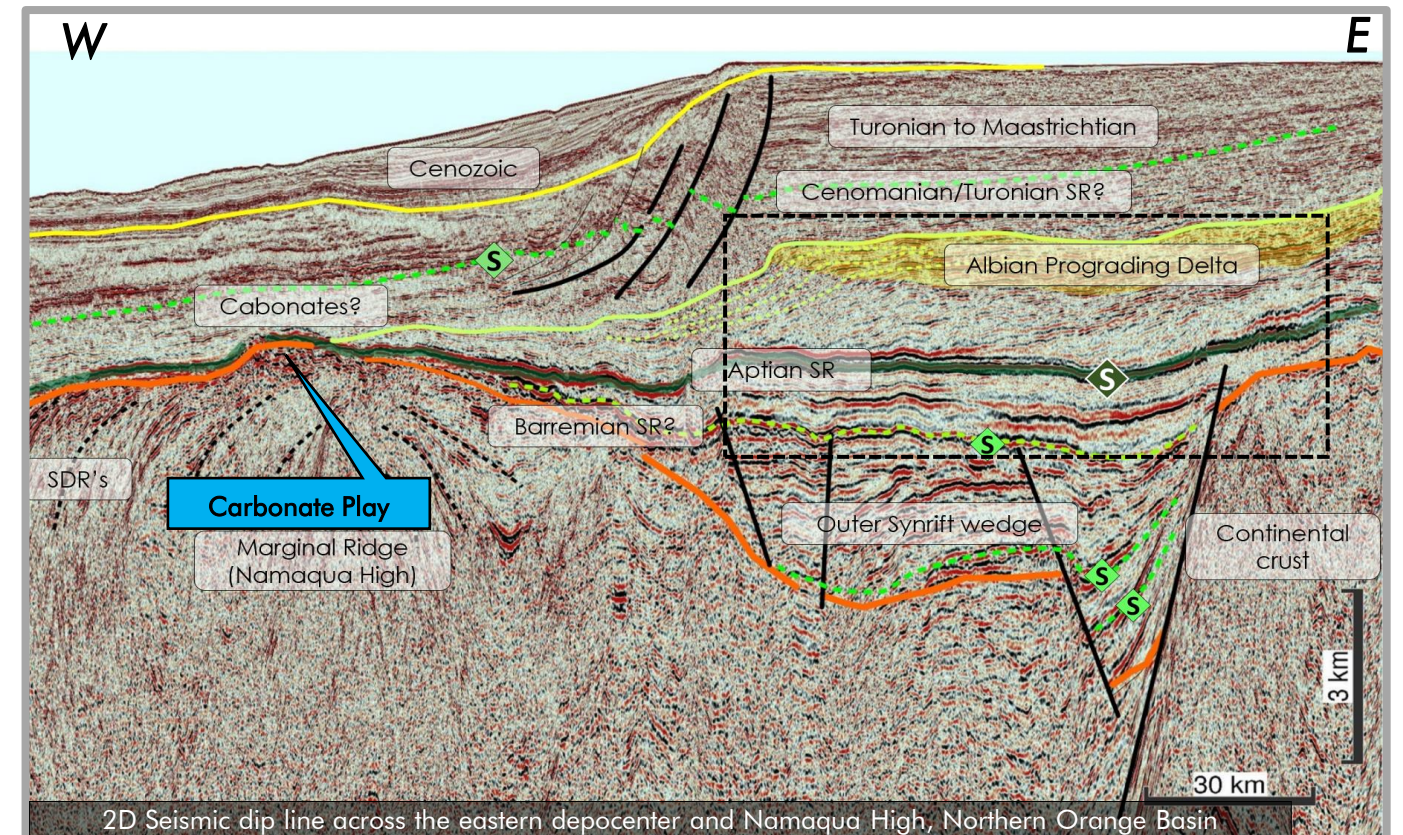


Early Cretaceous carbonate buildup (Salomo et al., 2022)



Map showing location of 2D seismic line below

Location within the northern and central Orange Basin where possible carbonates are seen on seismic data. This play type resides along the in the vicinity of the Namaqua High and above the western edge of the eastern depocenter.



2D Seismic dip line across the eastern depocenter and Namaqua High, Northern Orange Basin