

Deep-Water Prospectivity Along The NW African Margin: An Integrated, Remotely Sensed Technique To Assess Hydrocarbon Potential

Pedro Barreto and Mike Oehlers

NPA Group, Edenbridge, Kent, UK

It is often rewarding and desirable to high-grade exploration acreage offshore by taking an integrated on- and offshore approach and in this paper we look at how onshore structures and seepage patterns surrounding the Agadir Basin in western Morocco, can be extrapolated into the offshore using GIS and interpretative, remote sensing techniques.

Landsat Geocover, Shuttle Radar Topographic Mission (SRTM) and geological mapping from published sources form the bases for the onshore component and Free Air Gravity, bathymetry, geology maps and sections from published sources were added into the offshore realm.

The onshore satellite imagery and DEM data were interpreted using established photo-geological principles. Onshore seep locations derived from public domain data were added and compared to the structural trends and integrated into the GIS model.

Similar techniques were used in the offshore where data allowed: published seismic and map data were linked with the observed onshore trends and extended into the offshore. Seepage patterns were then interpreted using backscatter intensity data derived from satellite radar (SAR) data. Once natural film slicks and pollution slicks had been removed from the sample, repeating and higher ranked single seepage slicks were isolated and related to both onshore seepage patterns and regional structure.

The results revealed some interesting correlations between seepage distribution patterns and interpreted offshore structural trends to the offshore Malm Carbonate Bank Front and the Neocomian-Aptian Delta Front play fairways. Furthermore, geochemical slick sampling of the persistent offshore seeps can reduce risk by confirmation of the type and maturity of the presumed Jurassic and Cretaceous source rocks in this basin.