GEOSPATIAL MAPPING AND 3D GIS BASED VISUALIZATION OF SUBSURFACE STRUCTURES

Arafat Mohmmed M [1,2], Palanivel K [1,2] , Kumanan C.J [1,2] , Saravanavel J. [1,2] and Ramasamy SM[1,2*]
[1] Centre for Remote Sensing, Bharathidasan University, Tiruchirappalli – 620 023, Tamil Nadu, India
[2*] Gandhigram Rural University, Gandhigram, Dindigul, Tamil Nadu, India
Contact Author: Arafatmohmmed@gmail.com, kkpvl@yahoo.co.in

ABSTRACT

The objectives of subsurface mapping and visualization are to find and develop oil and gas reserves. These objectives are best achieved by using and integrating all available data and correct application of these data. In this study various aspects of geosciences interpretation and the construction of subsurface maps based upon data obtained from gravity, bore wells, and seismic data are involved. It is concerned with correct structural interpretation and mapping techniques and generation of most reasonable subsurface structures by interpreting all the geophysical data. Subsurface data are either one-dimensional (well log) or two-dimensional (well log cross sections and conventional seismic sections). However, these data are used to generate a three-dimensional picture of the subsurface. There are a number of methods and techniques that can be used to validate an interpretation before investments are committed to a prospect, lease, concession, or fields. Geographic Information System (GIS) with the advances in technology has virtues in storing, manipulating, modeling, visualizing and integrating huge amount of geospatial databases. Integration of shaded relief maps generated from geophysical data can establish information about the subsurface structure. Geospatial modeling with the integration of geospatial information can permit high-grading of leads and prospects and also credibly delineate/focus the potential corridors where exploration activity should be taken up. GIS analysis of Breaks with rose diagram orientation has been done. Further integration of all the above data had been done to arrive at the targeting zones of leads and prospects that are showing growth structures from the Basement for further analysis.

Keywords: 3D GIS, DGEM, Seismic Depth, Subsurface Structures, Yemen.