

Evaluating some applications of GIS technology in geological data management and processing methods: A case study from part of Northwest Borneo Basin, Sabah

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The Tertiary Northwest Borneo sedimentary basin which extends from the western part of Sabah through Brunei into west-central Sarawak is exposed in the Klias Peninsula and on Labuan Island. Extensive field studies followed by integrated laboratory investigations is being undertaken by the researcher with the aim of reconstructing the depositional environment and sedimentation history of the area in order to assess their implications on the hydrocarbon potential of the area. Data gathered are categorised into different types: sedimentological, stratigraphical, palaeontological, geochemical and petrographical. A data dictionary is being developed and spatiotemporal and the attribute data are being modelled.

For broader qualitative and quantitative analytical purpose the spatiotemporal data sets are being modelled in a GIS using both the vector and the raster data models. Attribute data are modelled by object oriented techniques and the data base is structured by using advance SQL techniques for the easy accessibility for interactive modelling purpose. Advanced isomaps based on characteristics such as geochronological, sedimentological, palynological are being produced and incorporated with digital terrain models for 3-dimensional analytical purposes.

A Graphical User Interface (GUI) is being developed and the optional analytical tools are provided for the interactive simulation modelling. Hypermedia techniques are proposed to enhance the interactivity. Graphics and object attributes and their network relationships are tested. In conclusion the use of GIS is evaluated and illustrated for its analytical as well as spatiotemporal modelling capabilities for geological data management and analysis.
