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THE QUANTITATIVE GEOLOGICAL APPROACH FOR OIL AND
MINERAL EXPLORATION

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ABSTRACT

The Geocomputation Laboratory at the Institute Technology of Bandung is presently conducting a research project sponsored by the PERTAMINA - ITB Research Grant. The main purpose of this project is to use a quantitative geological approach through numerical geology modeling.

The quantitative computer models in geology include Deterministic Dynamic Models, such as numerical basin modeling, orogenic evolution modeling involving burial geohistory, thermal geohistory, geodynamic and structural development predictions by deductive reasoning. These programs are supported by applications of various statistical models, mapping by contouring, construction of block diagrams, cross-sections based on outcrop and drill hole data and predictions by statistical projections.

Some of the research activities at the ITB Geocomputation Laboratory are focused on :

- Developing a burial geohistory computer model to construct geohistory diagrams at specific time increments by using age-depth curves.
- Developing deterministic dynamic models involving accurate determination of absolute numerical ages of layers or rock units.
- Developing computer programs to convert biostratigraphic data into numerical absolute ages by construction of age-depth curves of well-sections.
- Developing a computer program to construct paleobathymetric curves of well-sections based on biostratigraphic data by converting paleogeologic ranges of benthic foraminifera into numerical paleo-sea bottom depths.
- Determining appropriate compaction equation constants and parameters for west Indonesian Tertiary basins using shale porosity curves based on sonic and density logs.
- Studying one component of deterministic dynamic basin modeling.

One of the next research programs is to develop stratigraphic/basin-fill models based on sequence stratigraphy concepts.

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