



Geostatistical Simulation of Reservoir Characteristics in the Region of Adiyaman, Turkey

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The simulation applications include determination of major geologic patterns, chemical compositions of different lithological units, parameters such as porosity and permeability, hydrogeological modelling and determination of mine planning. Karababa C Formation's reservoir characteristic, porosity and hydrocarbon saturation which is one of the reservoir rocks of Adiyaman region in Turkey were examined by using geostatistical simulation methods. Geostatistical evaluation of study area was done by using special geostatistical softwares. By using geostatistical simulation softwares three dimensional evaluation of the study area was done and variogram functions were calculated. Variograms which were obtained from porosity and hydrocarbon saturation values were modelled spherically. Model parameters with $C_0=0.0003$, $C=0.0020$, $a=400$ for porosity values and $C_0=0.01$, $C=0.04$, $a=450$ for hydrocarbon values were determined. The suitability of model parameters were validated with back-kriging technique. The study area was separated into blocks for x direction 300×10 m, for y direction 120×10 m and for z direction 15×10 m and evaluated conditional simulation was done by using "annealing simulation method". Some statistical parameters such as mean, variance, histogram and variogram were calculated and evaluated of 540000 simulated data values which were obtained for porosity and hydrocarbon saturation. Simulation results were evaluated on cross-sections at different directions. According to the simulation results in the Karababa-C Formation, the porosity values decrease with 7.3 % up to down, and then at deep porosity values increase with 6.8 %. The main reason for the preservation of the porosity values at great depths is the overpressure effect. Also the amount of hydrocarbon saturation tends to decrease with increasing depth, as well and the decrease ratio is 7.2 %. But the hydrocarbon saturation values at deep displayed no increase.