

THE APPLICATION OF TRADITIONAL AND ORIGINAL SEISMIC METHODS FOR DIRECT DETECTION OF HYDROCARBONS (CASE STUDIES FROM PARAGUAY AND WESTERN SIBERIA)

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Among the desired seismic prospecting substantial parameters the oil and gas saturation is the most essential one. At the same time this factor causes specific seismic effects that can be measured from field data. Several independently calculated seismic attributes, anomalies of which are considered as the result of hydrocarbon saturation, have been used. The measurements of these parameters can be the additional stage of seismic processing. The general oil and gas bearing survey of the area is given by the maps and sections of the attenuation decrement anomalies. This parameter is estimated from the big time intervals in order to reduce the influence of the variation of lithological factors. The calculation of stack velocity frequency dispersion gives the independent control of attenuation decrement anomalies and allows us to locate anomalous zones on vertical section. Our approach includes the investigations of AVO-attributes frequency dependencies and the slow wave phenomenon study. This data allows us to make the forecast of some oil and gas fields properties and the character of saturation. The discrete-fluid modeling shows probable migration paths and areas of the most likely hydrocarbon concentration and so helps in mapping of perspective zones. In case if all of these data, including results of morphological analysis, can be formed in a non-contradictory system, the reliability of pool diagnostic becomes rather high and even allows us to get the quantitative estimations. The examples obtained in Paraguay and West Siberia illustrate the effectiveness of this approach on different stages of exploration and development.