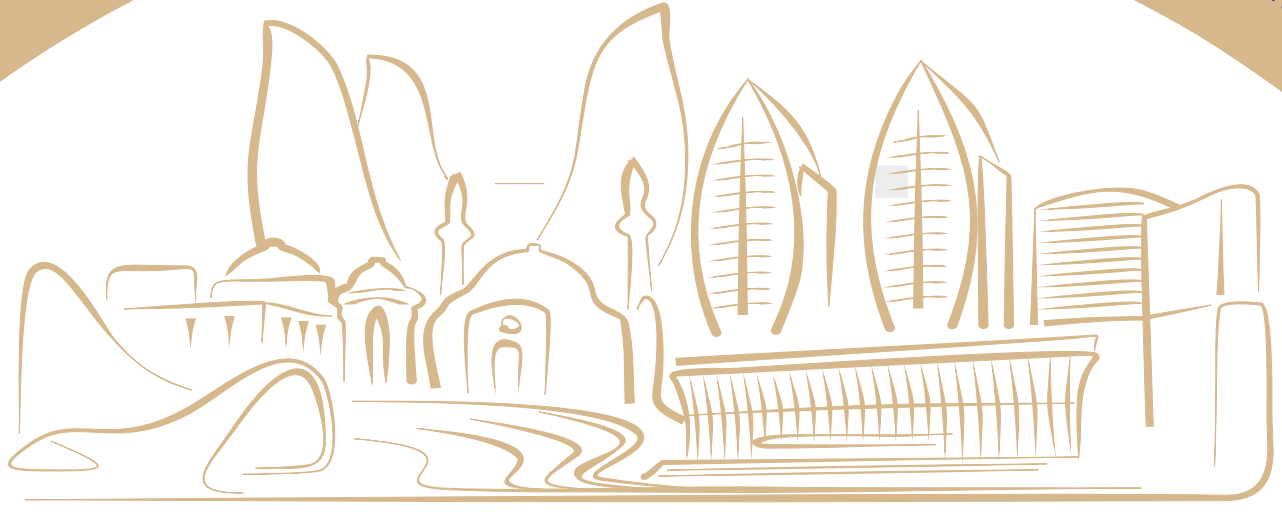
VII INTERNATIONAL CONFERENCE OF YOUNG SCIENTISTS & STUDENTS



INFORMATION TECHNOLOGIES IN SOLVING MODERN PROBLEMS OF GEOLOGY AND GEOPHYSICS

Dedicated to the 80th anniversary of
Institute Geology and Geophysics,
Azerbaijan National Academy of Sciences

BOOK OF ABSTRACTS

15-18 October, 2018

Baku / Azerbaijan

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These attenuation and dispersion curves behave in a same manner as saturation of gas changes. It can be depicted (Figure) that the maximal compressional velocity dispersion (increase of seismic velocity as a function frequency) and attenuation due to WIFF happen at low gas saturation (13 %).

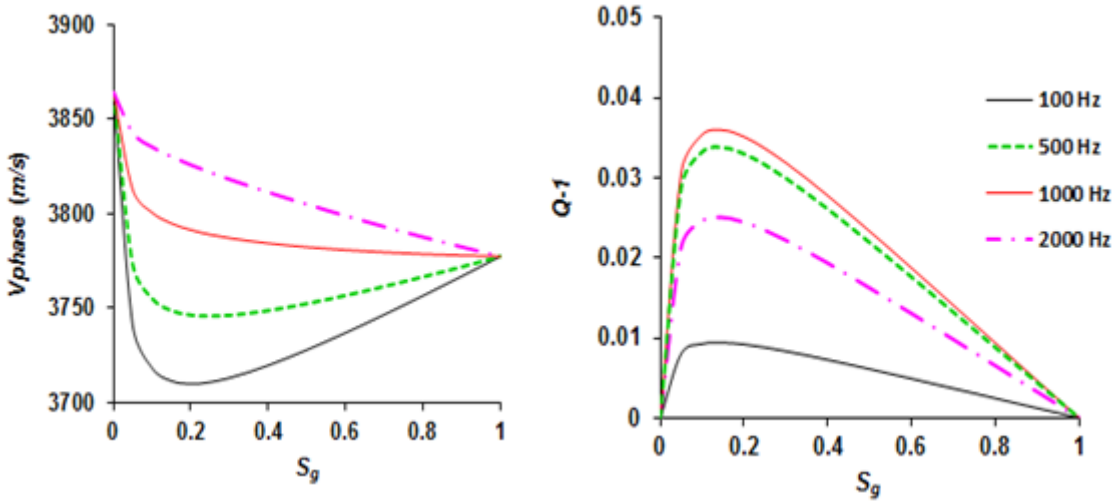

Fig. The Phase velocity and inverse quality factor (attenuation) are plotted versus gas saturation at different frequencies. It is noted that the maximum change in velocity and inverse quality factor is at small gas saturation (about~ 13 %). Thus these two attributes can be used at potential indicators to indicate the low gas saturated reservoirs.

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USING GOOGLE EARTH IN NEOTECTONIC STUDIES

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To create a GIS-project for geological research, an alternative program in addition to ArcGIS, MapInfo, etc. Google Earth may be used. The main technical advantages of the program are open access of software, cross-platform KMZ file format, its compactness. So, information exchange with colleagues can be easier and faster, and this contributes to

improving the quality of scientific communication in general.

As in other GIS-systems, in Google Earth it is possible to use thematic layers with coordinate referencing which allows to make regional geological interpretations geographically. Figure 1 shows a map of gravity anomalies of the Crimean-Caucasus region).

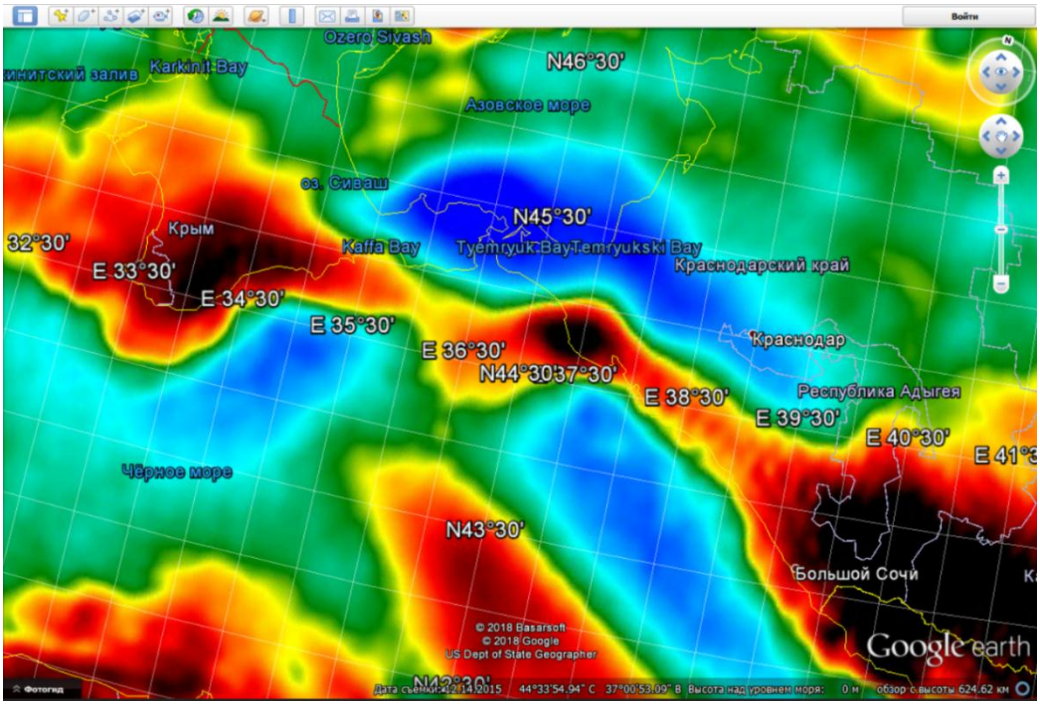

Fig. 1. Map of gravity field in the Crimean-Caucasus region (work space of the program).

One of the most important advantage of the Google Earth program applying directly to geology and particularly to structural geology is a high accuracy of the data as well as possibility of online zooming. As an instance, it is possible to trace a fault very precisely, and dynamically zoom an area of interest if needed.

Another advantage of Google Earth in neotectonic studies is using relief tool as well as imposition of geological and other rasters on the topography. This advantage is directly related to making geological-geomorphological profiles. A classical method in geomorphology is creating of longitudinal profiles of river terraces. The use of the 3D survey allows geologists to make effective cross-sectional profile lines. Creating of series of profiles which cross a valley makes possible an identification of the terrace edge with high accuracy. Another application of Google Earth relief tool in geomorphological studies is a reconstruction of hilltop surface. In this case, a scientist draws profile lines along the adjacent ridges. It makes possible to reconstruct ancient surfaces which were uplifted due to tectonic movements and are now separated by scarps from each other. A magnitude of an uplift may be estimated on the basis of a magnitude of erosion. This idea could be illustrated with the profile of the ridge in the North-Western Caucasus (Figure 2), where the blue line is the profile along the thalweg as the local basis of erosion, the red lines are the profile along the ridge. On this profile three hilltop surfaces separated by scarps are clearly distinguished. They can serve as an evidence of different rates of uplift of these ridge sections.

Thus, in this short review some features of Google Earth applying to neotectonics are demonstrated.

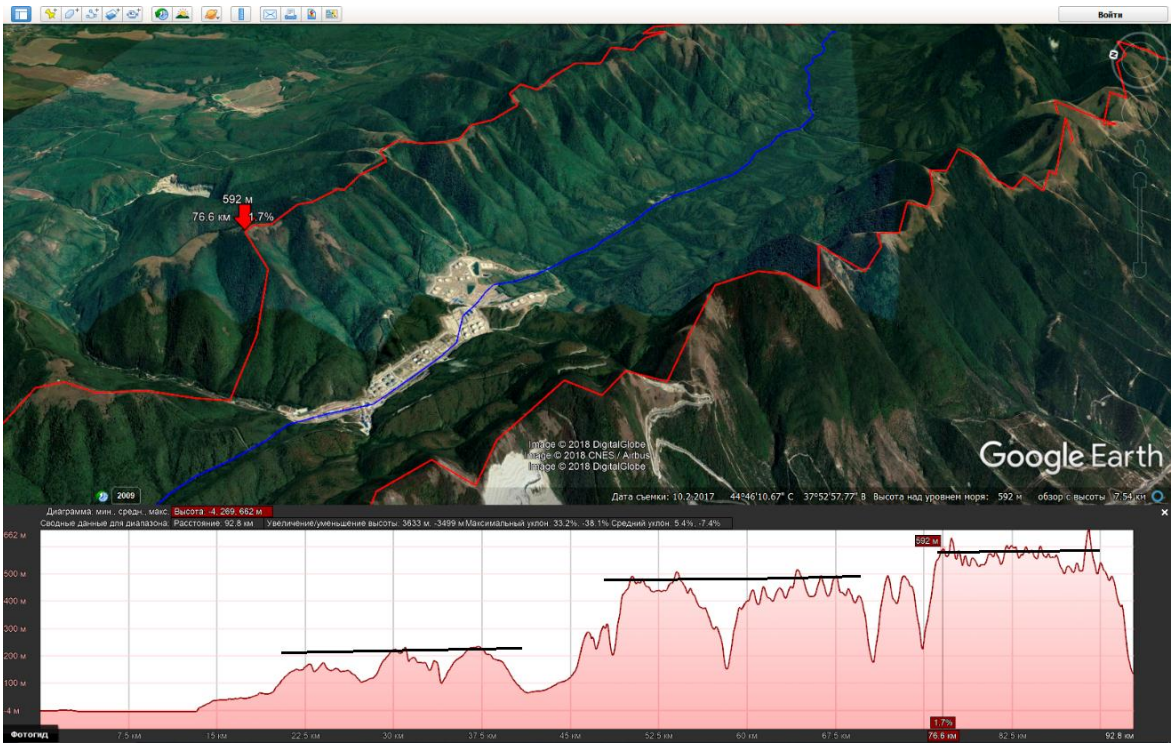

Fig. 2. Profile of dividing surfaces in the North-Western Caucasus.

STUDYING OF EXOGENIC GEOLOGICAL PROCESSES IN THE COASTAL ZONE OF LAKE GYRMYZY BY THE METHOD OF ELECTRICAL PROSPECTING

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The Lake Gyrmyzy is located in a southeast part of Baku. In order to study the exogenic geological processes (EGP) in the coastal zone of the lake, electric prospecting works was carried out by the method of Vertical Electric Sounding (VES) in scale 1:5000. Preliminary for Geophysical research was selected profile (I-I), in the northeast direction

The geological tasks set for geophysical surveys:

- Detailed separation of the geological cross section to a depth of 40 m;
- Identification of alleged discontinuous violations;
- Determining the thickness of lithologic layers;

Field geophysical works were carried out with the of geophysical equipment ERA-MAX. As a result of field works the estimated litological-geophysical cross section on a profile I-I was structured. In the structured cross section layers of different lithologic structure and thickness are revealed, their angle of incidences and also electrical resistivity are determined (e.r) (Fig.). In the upper part of the cross section identified deluvial sediments, lithologically composed of clays and clays with sand, of thickness 1-6 m, with, electrical resistivity 10-20 Om•m. The prevalence of this layer in the study area is intermittent. The second layer in the lithologically, presumably consists of clays. Layer thickness along strike changes frequently in the range of 2-7 m, electrical resistivity, with