GRAVIMETRIC RESEARCHES IN ASSESSMENT THE CAUSES OF THE APPEARANCE OF GAS ON THE COAST OF ZAGULBA

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In order to assess the causes of gas contamination of the sea in the north of the Absheron Peninsula, the village Zagulba, gravimetric studies were carried out with a modern Canadian CG-5 AutoGrav gravimeter and a Russian GNU-KS gravimeter (Fig. 1). The measurements were carried out in a network of profiles (Fig. 2-4) with full coverage of the area.

Modern gravimetric methods include modeling areas close to the site of observation of the manifested gas, the selection of its geometric elements, the selection of zones with active stress dynamics and the identification of dangerous, hazardous places associated with geodynamic tension in the area of activity.

Research work by gravimetric methods, gravimetric measurements on profiles in different directions in order to assess the causes of the occurrence of gas pollution in the sea near the village of Zagulba in the north of the Absheron Peninsula were carried out. The studies were carried out at a distance of 100 meters between observation points.

Figure 1. Canadian gravimeter CG-5 AutoGrav and Russian gravimeter GNU-KS

Figure 2. Scheme of gravimetric observation points carried out in the study area

Symbols:

Observation points

Profiles

Methane gas

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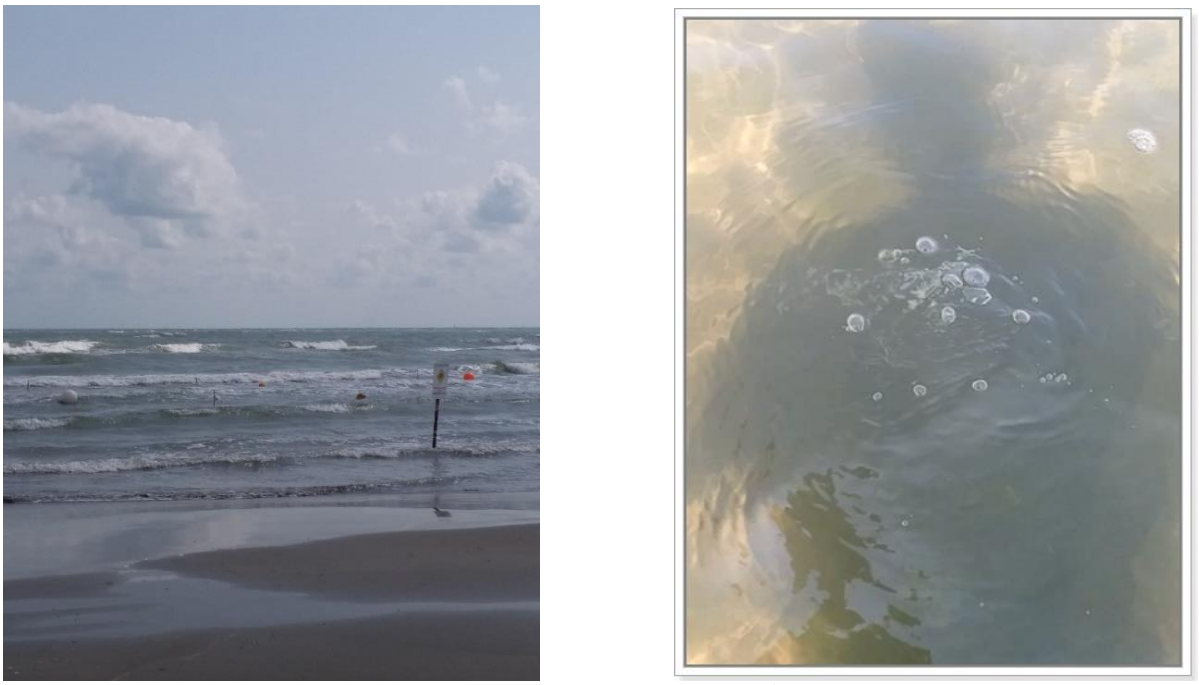

Figure 3. Methane release and photos of the surroundings

Figure 4. Gravimetric and magnetometric measurements in the area of methane gas manifestation

Great attention is paid to field planning. The methods of field observations with high-precision gravimeters is determined in accordance with the requirements for identifying subjective and other factors that affect microseismicity, accuracy and reliability of observations, acceleration of free fall of non-tidal variations in time. For field gravimetric observations, as mentioned earlier, Russian GNU-KS and Canadian CG-5 Autograv were used. These devices make it possible to detect changes in gravity in the proposed polygons during repeated gravimetric measurements.

In order to assess the causes of gas contamination of the sea in the north of the Absheron Peninsula of the village of Zagulba (Fig.5), a gravimetric network was created to measure the relative gravity, measurements for each profile and measurements with the aim of "0" point were taken.

As can be seen from the isoanomalous map of the gravitational field, the anomalous zones are covered by a variable value of the relative gravity (Molodensky M.S., p. 128). Thus, the relative gravity remains open in the west and closed in the east, with a minimum value in the northeast and southeast of the study area, and the anomaly extends from 0.185 mGal to 3.514 mGal from west to east.

This anomaly is completely extended from west to east from the first observation point of profile V, from observation points 2 and 3 of profile I. If you pay attention to the 3D model of the stress-strain state of the geological environment the above interpretations are more accurate (Fig. 6).

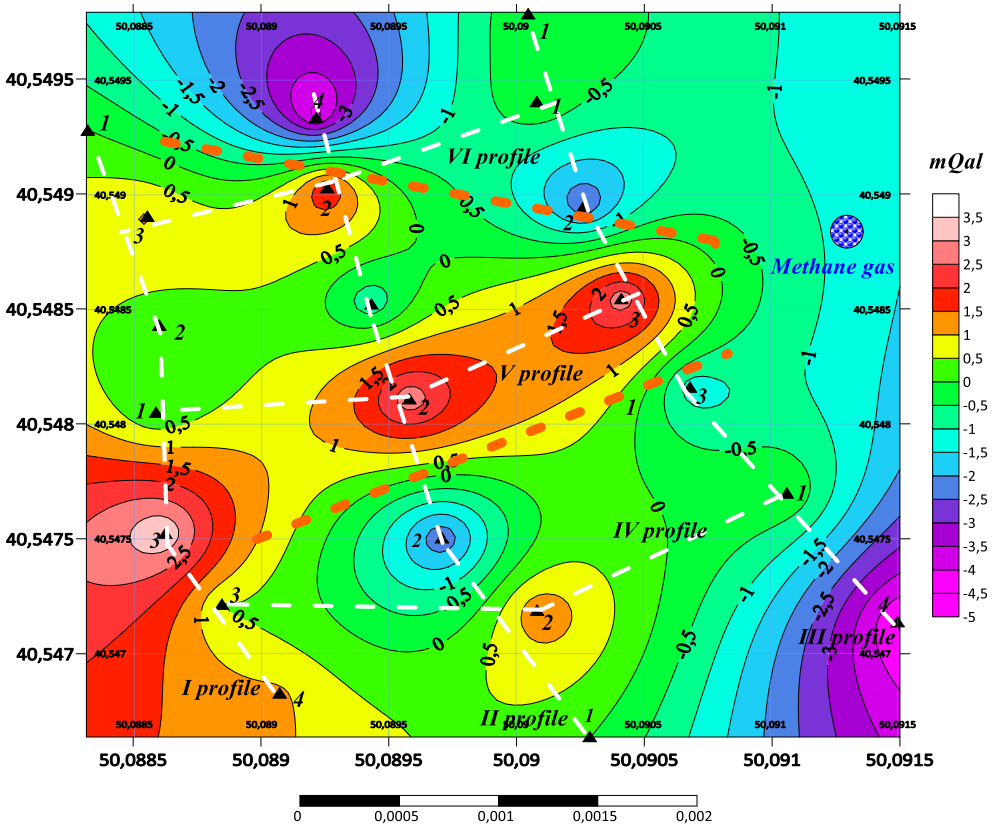

Figure 5. Isoanomalous map of the gravity field, reflecting the stress-strain state of the study area

Symbols:

Observation points

Profiles

Destruction zones

Methane

In local areas, including spectral analysis on the shadow map, gravity is accompanied by an increase and decrease in the intensity of the gravitational field, which is also visible (Fig. 7).

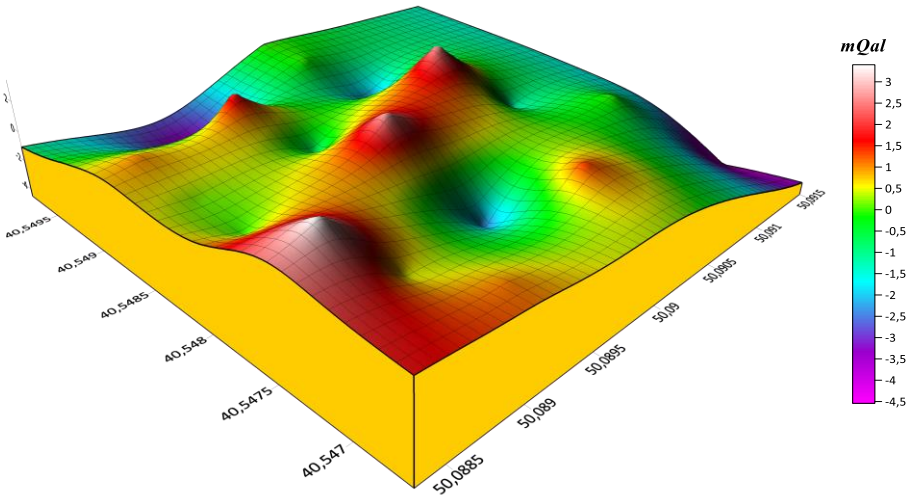

Figure 6. 3D model reflecting the stress-strain state of the study area

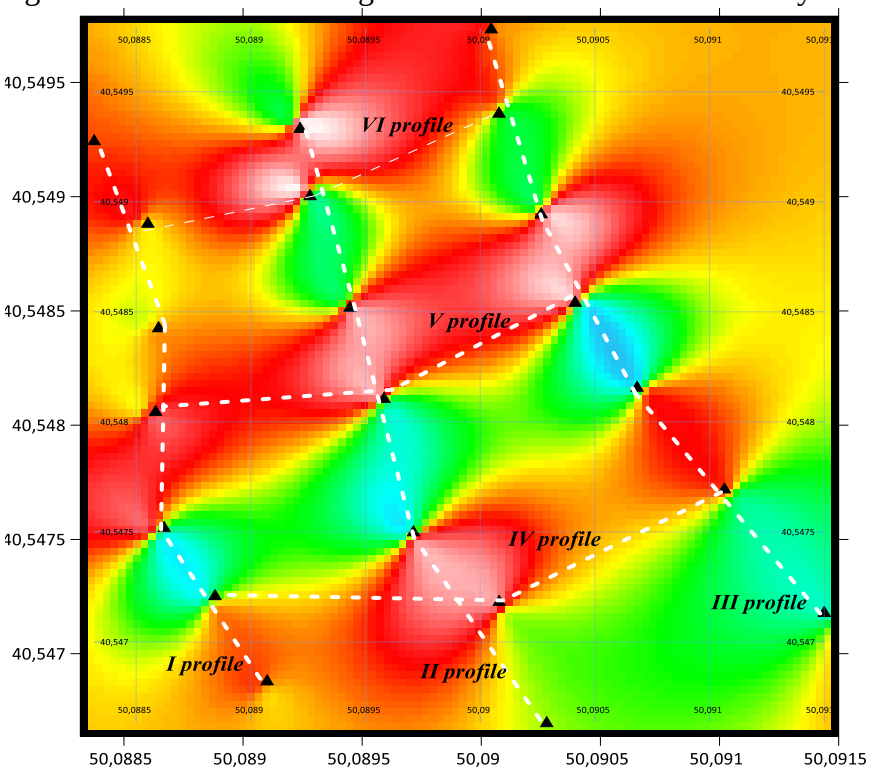

Figure 7. Spectral analysis of the gravitational field reflecting the stress-strain state of the study area

CONCLUSION

1. The nature of the change in gravity at the polygons was studied by repeated gravimetric observations, 2D and 3D isoanomalous maps of the gravitational field were compiled. The field revealed anomalous zones with variable values of relative gravity. Relative gravity is observed in

the northeast and southeast of the study area with a minimum value, and from west to east from 0.185 mGal to 3.514 mGal.

2. The geodynamically stressed conditions of the ground and gas-bearing areas adjacent to the sea are high. Earthquakes occur regularly (ml=3.0-4.0) in the vicinity, the influence of relatively strong earthquakes (ml $\geq$ 4.0) is felt here.

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