

# **THE ECOLOGY PROBLEMS AND POSSIBILITIES TO MANAGE THEM: THE NEED TO CREATE A GLOBAL GEOPHYSICAL MONITORING SYSTEM**

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Global environmental changes become more and more intense and threatening. Their artificial nature due to uncontrolled industrial activity raises no doubts. The main factor that led to the current situation is, in our opinion, the violation of the relation of energy exchange between the planet and the medium containing it, the cosmos.

Instability and, we would say, imbalance of natural processes, are obvious, and this makes the further development of the prediction of negative effects problematical. It is equally clear that some immediate measures are required, including creation of a system for global environmental monitoring of the processes and measures that may allow compensating and restoring broken natural relations, which in turn leads to the need to develop appropriate methods for their monitoring and management.

Our research and experiments focused on attempt to create such methods in recent decades have led to some success. The complex of geophysical fields has been involved in the analysis of state of the environment: measurement of its parameters and state was held by seismological, gravimetric, electromagnetic and topographic methods. The results allowed developing energy models of the medium and appropriate impact models.

The scientific background of the conducted research was a discovery of unknown behaviour of weak high frequency seismic signals, microseisms, which led to a new understanding of the physics of the Earth processes, and recognised by State Committee of former USSR for Discoveries and Inventions as new physic phenomena in March 1988 and granted a status of the Scientific Discovery with priority from May 1979. "Previously unknown regularity of changes in microseisms before an earthquake has been established, which stipulated at the distance that exceed the size of the epicenter zone there are being registered a multi-stage increasing in the intensity of microseisms with simultaneous decreasing of their main frequency and there arise recurring impulses (zugs) of micro-oscillations that are increasing in intensity and decreasing in time between their appearances, which are polarized in the direction of the epicenter of the future earthquake".

The impacts were conducted on certain volumes of the medium, which contains the large heterogeneities, - the oil fields, - while their linear dimensions 2-3 times exceeded the size of the heterogeneities. In this connection, the Technology of Vibroseism Impacts to manage medium's stress state, reservoir pressure and production was developed and implemented.

As a result of impacts conducted in each case we sought to bring the medium into energetically homogeneous state, and then to keep it as long as necessary. The

impacts successfully done at the areas of 100 sq. km, 500 sq. km and 2000 sq. km, but the results of numerous measurements of geophysical fields in remote observation points showed that they actually covered 15000-20000 sq. km.

Conclusion: The experiments proved the possibility of monitoring and management of the medium and creating ways to protect territories from the negative third-party impacts, in this case, ecological, and this experience can be extended to any region, which underlines once again the possibility and need to create a global system.