



Investigation of karst-hazardous area by geophysical methods

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The express technology of geophysical investigations, which includes geoelectric methods of forming of short-pulsed electromagnetic field (FSPEF) and vertical electric-resonance sounding (VERS) (FSPEF-VERS technology of geoelectric investigations), and also seismic-acoustic and georadar soundings (Bokovoy et al., 2003; Levashov et al., 2004) was repeatedly applied for prospecting and contouring the water saturated collectors and underground water streams; for studying the engineering-geological conditions on territories of historical-and-architectural reserves; for engineering-geological investigations during the reconstruction of highways, etc. In 2008 the geoelectric and georadar methods were successfully used for studying the site of intensive development of karstic processes in area of Pysky village, Lviv region, Ukraine.

The analysis of results of integrated geophysical investigations allows to state the following.

1. The powerful zone of raised filtration of underground waters was allocated and mapped due to field investigations in Pysky village area. This zone is forming to the north from village in two ravines location area. The surface water sources were revealed in the upper parts of ravines. It was established, that these sources are formed by underground waters which migrate from lower aquifers. Surface sources promote the development of erosive activity and formation of ravines on a northern hill side. The powerful underground water streams are formed also in a zone of sources. They migrate in southern direction, across Pysky village. The water streams are localized in village area, they leave on a surface in Prerva river valley, forming the lake which has the karstic nature.
2. Underground migration of the allocated water streams was not fixed behind lake by the FSPEF method survey, hence, the territory to the south from lake is not karst hazardous. It specifies that underground water streams, which cross the central part of Pysky village, are local. So, water sources in northern part of Pysky village, underground water streams in the upper part of gypsum-and-anhydrite stratum and lake of the karstic nature form local natural hydrodynamic system which causes karstic processes in the central part of village.
3. The site of an intensive underground water stream crosses the central part of Pysky village. Within this territory 12 channels were allocated and traced on depths from 25 to 35 m; they are optimum for karstic cavities formation. Mapped channels were formed, in general, in upper, watered parts of gypsum-and-anhydrite stratum, along a southwest direction of these rocks tectonic fracturing. The obtained new geophysical data testify that all earlier formed holes and funnels are within the limits of zones of the allocated karstic channels.
4. The carried out field researches have testified about efficiency of FSPEF and VERS geoelectric methods during studying and mapping the zones and sites of the karstic processes developments, the water saturated layers, the underground water streams. The listed geoelectric methods can be used effectively also for operative monitoring of both natural and man-caused dangerous phenomena and processes connected with karsts, failures, subsidences, suffosion carrying out of soils, etc. The areal mapping by a FSPEF method allows to allocate and contouring effectively the zones of underground water streams migration, and also of the raised soil moistening. The methods of electric-resonance, seismic-acoustic and georadar soundings give the possibility to define bedding depths of the moistening zones, underground water streams, suffosional cavities, karstic sluggies.

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investigations. 66nd EAGE Conference and Technical Exhibition. Extended abstracts P035.