



Monitoring studies of slide system under the action of seismic impacts

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The immediate detection of landslide activity that is provided by real-time systems can be crucial in saving human lives and protecting property. Traditional field observations, even if taken regularly, cannot detect changes at the moment they occur. Moreover, active landslides can be hazardous to work on, and large movements often occur during storms when visibility is poor. The continuous data provided by remote real-time monitoring permits a better understanding of dynamic landslide behavior that, in turn, enables engineers to create more effective designs to prevent or halt landslides.

Monitoring of the coastal zone involves the following block diagram: input – processing –output – feed-back. We feed the input with data on a studied technogenous loading on the coastal zone, and the input presents the analysis of motion of a geological medium and the subsequent forecast of evolution of its lithodynamic characteristics.

The submitted report describes a practical system of monitoring for the Central Livadiya Slide System (CLSSC) of the Crimea, which is intended for the diagnostics of a lithodynamic situation in the real-time mode, conducting the data base on heliogenous and lithogenous parameters, and predicting a future state of the slide-containing system.

In the system of monitoring of a state of CLSSC, which is realized on a computer, the registered heliogenous parameters include the level of solar activity, changes in temperature and moisture regimes, changes in the character and intensity of precipitations, the wind velocity, etc. In this case, data are introduced into the computer in the manual mode. Lithogenous parameters are presented by a collection of conditions and factors characterizing the mechanism and dynamics of changes in the equilibrium state of slopes of CLSSC. The control over the evolution of lithogenous parameters is realized in the following way:

1. The control over movement of the control points on the surface of active slides is carried out through high-precise visual observations and a subsequent manual entry of information into the computer.
2. The continuous control in the real-time mode is realized by using electric inclinometric transducers, which register the evolution of changes in angular deviations for the distinguished regions and zones inside the slide body (in certain bore holes in the body of a slide).

As a peculiarity of the software, we note the possibility of a long-term operation in the real-time mode without any participation of the operator.

The report presents results of the statistical processing of the data base of statistical and dynamic parameters given by the measurements and observations of CLSSC. For separate parameters, we established certain correlation dependences. Along with mathematical modelling of the territory under study, the practical system of monitoring of the Central Livadiya Slide System of the Crimea enables one to perform earlier and more reliable predictions of the concentration of stresses and possible slide shoves and can become a base for creation of the expert system for CLSSC on its basis.