Geophysical Research Abstracts
Vol. 16, EGU2014-9799-1, 2014
EGU General Assembly 2014

Assessing the complexity of topographic mass in complex terrains

Azimkhan Kurmankozhayev (1), Vaclav Nemec (2), and Edil Sarybaev (3)

(1) Architecture and Building Institute, Kazakh National Technical Univesity named after K.I.Satpaev, Almaty, Kazakhstan (kurmankozhaev_a@mail.ru), (2) Czech Rebublic (lidmila.nemcova@quick.cz), (3) Mining and smelting Institute, Kazakh National Technical Univesity named after K.I.Satpaev, Almaty, Kazakhstan (edilait@mail.ru)

To assess the structure of terrain more objectively it is necessary to supplement and clarify the available characteristics with a number of numerical statistical indicators and formulas that reflect the actual links between separate features of terrain. Results from analysis of traditional variability assessment methods for characteristics of georesources allow concluding that a characteristic's variability usually has oscillatory and wavelike geometric image in the form of broken, polygonal, zigzagging, polyhedral and, less frequently, regular geometric shapes, defined by deviation amplitude and period of irregularities. It is established that variability cannot be evaluated with one universal indicator since variability consists of a random and a regular component, thus it is considered reasonable to assess the characteristic's variability depending on current mining and geometrical tasks and by stages of georesources development. The recommended topographic terrain mass complexity assessment method is based on the leading concept of using properties of specific anti-entropy that, unlike regular entropy, allows accounting for changes in total number of component elements in stable populations for the topographic terrain mass. Concept of utilizing value of specific anti-entropy, widely used in information theory, is taken as an assessment criterion for integral complexity of topographic terrain mass. Modification of specific anti-entropy formula, as applied to substance of formation of the georesource development target's topographic mass integral complexity, is based on qualimetric model of its assessment. Essence of the model comes down to determining the topographic mass complexity using the topographic mass structure uncertainty measure, assessed using the quantity of heterogeneous morphometric elements contained in the topographic surface of terrain. The main basic reference value in qualimetric model of the topographic terrain mass complexity is the information measure – amount of information (H). The recommended method is characterized by accuracy and differentiation of result generation; it can be used during survey, formation, preparation and parameterization of topocartographic products, and taken as a starting basis for solving problems of measurement density optimization and land volume parameters calculation efficiency.