JOINT METHODS PROVIDED IN REMOTE SENSING FOR INVESTIGATION THE LAND

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ABSTRACT

The paper gives an account on the main causes which demand elaboration of the common method for ground investigations using remote sensing, among which are the following: incomparability of the results received from different examinations; the lack of the common demands to the list of the studied characteristics and parameters; the lack of coincidence between spatial boundary of the natural objects and parts of the ground surface which have common reflecting and radiating properties, adequaty in comparison of a signals characteristics with the volume of the sensing object, which is forming a signal (radioforming volume) and so on. The structure of methods of the ground providing remote investigatiens (sensing) was suggested. It includes systems of methods, subsystems, blocks of the methods, private methods and generalizations. The grounds of the method's system are the methods of structure's investigation of the radiogeosystems, functioning and operative functioning (groups of the momentary state) of the radiogeosystem. The detailed list of the method's blocks and private methods of the radiogeosystemic investigations was brought.

KEY WORDS: authenticity,standard,comparability, radiogeosystem,volume,methodology, structure, functioning.

INTRODUCTION

The main dificulties in the use of the space exploration's materials lie, first of all,in their incomparability.It is explained by the lack of the common demands to the surface measuring, including the choice of the standard complex for the testing areas; also by restricted orientation of the task done by the testing areas; by the lack of the common demands to the list of the obligatory studied parameters and characteristics;by the lack of the surface exploration theory;by use of traditional methods of the land covers' explorations which don't take into account the character of electromagnetic radiation both of its own and a reflected one. Registration of the mentioned and others causes would raise not only efficiency of space surveys materials' use but the authenticity of their decoding.

DISCUSSION AND RESULTS

Specificity of the reflected radiation and emanation of its own, especially in the radio-range, demands spesial approaches to the surface exploration of the landscapes and their components. But the main thing is that these approaches must be common. Only in this case the comparability of results and conclusions will be seached. The principle of the strict functional dependences between parameters of the accepted signal and characteristics of the natural objects' elements must be assumed as a basis of the ground providing remote sensing method. Spesial attention should be paid to the task of determination of natural limits of the volumes, which characteristics influence parameters of the forming electromagnetic radiation of one or another type of the geographic object.It is very important since different compositions of the land surface's signals can form the same parameters of the reflected signal or a signal of its own, i.e. there is no mutually designated conformity between the space of the object and the space of reflection. This factconsiderably complecates the recognition of the shape. Due to this the necessity of elaboration of comparatively-temporal approach to the analysis of the land surface characteristics arises. These characteristics provide contrasts of its reflection. Next difficulty and the cause of discrepancy of the results lies in the lask of the common units of classificational division of the land's surface. In most cases such unit of classificational division is a geosystem (or biogeocoenosis), i.e. objects which community of the reflected and radiated properties isn't proved (or more exactly isn't examined, but postulated). That's why the necessity of establishment a smaller classificational unit arises, i.e. the object of investigation which has common reflected and radiated properties.Such unit conditionally called by us, is a radiogeosystem. Discrepancy both in the spatial and sense relations of biogeosystem with the objects traditionally studied by geography,biology, forest studing and others studies, advances a demand of creation special methods of the land explorations with the purpose to decode materials of remote investigation creation of a quantitatively-statistical base adequate to the tasks of the radiogeosystem analysis and what is more observe accuracy necessary for radiogeosystem investigations.

All this demaunds creation of the specific radiogeosystem methods, getting of the new data of their treatment and analysis, elaboration of a special approach to the radiogeosystem generalizatiens. For this it is necessary to maintain and investigate geographic appropriateness of the spatially - temporal change of the parameters and properties of the landscape's elements which determine the level of the reflectional and radiational characteristics of the natural and naturally-antropogenical complexes.It is necessary to elaborate the methods of the maintaining of the levels of theseparameters and prognosis in different areas in broad temporal range.

Experience of ground observation shows that there is a real opportunity for creation relatively universal method of ground providing of remote sounding of the land surface. Under more strict approach to the terminology it necessary to create the base methodology which could provide the unity of the land remote sensing under indispensable condition of standardization.

Taken into account the complicacy and variety of the forms (structures, state) which express the object of investigation we used systematic approach providing staged study of the system's elements (elements methods) going into the final result - description of the integral system (full radiogeosystemic description of the natural and naturally - antropogenic objects). Systematic approach allows to include into classificational structure not only methods of ingenuous shedy of system's elements but also methods of the treatment analysis synthesis and prognozis. In this

connection the structure of the methods includes the following systems, subsystems and blocks of methods, elemental methods. The methods of generalization (Nekos V.E., 1988):

systems of methods: the method of radiogeosystem structure's exploration; mathematics methods; methods of exploration of radiogeosystems functioning.

subsystems of the methods: For structure's exploration: a) methods of the quantitative estimation of the fundamental characteristics; b) methods of description of the skeleton structure.

For investigation of the functioning:a) methods of functioning investigation ; b) methods of investigation of the operative functioning (of the groups of the momentary state).

For mathematical methods:a)methods of the planning and primary treatment of results; b) methods of modelling.

Block of methods, including private methods for quantitative estimation of the base characteristics: a) description of the specific properties of radiogeosystem including the quantity of the types of the structure's elements and classificational index of the elements; b) description of principal elements including the quantity of the base elements, lenear sizes, spatial allocation.

For description of the system structure:a) general description of the system's constituences, including coefficients of transition , horisontal projections and vertical structure; b) description of the spatial allocation, including the distance between elements, the angles of inclinatien and elements' orientation.

For investigation of the functioning: a) examine complication of a structure, including dynamic of the growth, projection of the crowns; b) examine stabilized structure including quantity and sizes, penetration; c) examine simplification of the structure, including the dynamics of its fall; d) examination of the winter structure, including characteristic of the snow thickness and volume's allocation.

For operative functioning investigation (the groups of the momentary state): a) examination of the temperature-moisture characteristics,including description of the temperature and moisture of the area, verical profiles, temperature and humidity of elements; b) examination of the windlability, including windlability of the radiogeosystem's units, windlability of the elements.

For planning and primary treatment of results: a) planning of the experiment (determination of the objects estimation of its representation; b)primary treatment,including statistic treatment, construction of distributors.

For modelling:a) modelling of the spatial-temporal regularities, including functional models; b) modelling of the radiogeocharacteristics, including statistical models.

Generalization: a) in radiogeosystem's structure investigation - receiving of all characteristics according to the base ones; b) in mathematical methods - determination of spatially - temporal regularities, radiogeosystemic prognosis; c) in investigation of the radiogeosystem's functioning-full description of the natural volumes and radio-forming volumes and getting of the main indexes according to the data of meteo broadcasts.

At the end of all methods' structure there's a full radiogeosystemical description of the natural and naturally-antropogenic object.

CONCLUSION

The author hopes that suggested structure of the methods will allow not only to gain the comparability of the investigation's results but also to get a new in volume and quality factural material, which will be able to raise the authenticity and effectiveness of the materials for decoding space surveys.

REFERENCES

Nekos, V.E., 1989. Methods of Radiogeography. Kharkov, p.1-88 (in Russian).