



ENVIRONMENTAL MONITORING OF SOIL SALINATION IN THE REGION OF THE SOUTHERN ARAL SEA

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ANNOTATION

The article deals with the issues of remote monitoring of soils in the Southern Aral Sea region "Ecological monitoring" is the action of continuous control, observation and forecast of the development of the natural environment.

KEY WORDS: progress, monitoring, remote method, UNESCO, ecosystem, biosfera.

RELEVANCE

Environmental monitoring as a modern scientific direction in the study of the natural environment began to develop from the beginning of the seventies of the last century, which was due to two reasons: 1) environmental degradation; 2) technical progress, capable of providing new means of operational control of the state of the natural environment.

At present, the concept of “environmental monitoring” means both continuous control, observation and predictive development of the natural environment (including all natural media, air, soils and their properties) based on modern operational research methods, among which the main place is occupied by remote sounding methods confirmed by ground studies [1].

The main tasks and concepts of environmental monitoring were formed in the last century in the UNESCO program “Man and the Biosphere” and a number of other publications. According to these documents, the purpose of monitoring is to effectively manage the state of the environment in a dynamically developing ecosystem. As a result of many years of scientific research, rich material has been accumulated, proving the necessity and possibility of applying a system of measures that ensures the elimination of the causes of land degradation.

MATERIALS AND METHODS OF RESEARCH

The objects of research in the work were soil samples taken from territories previously used for irrigation in all regions of the Republic of Karakalpakstan. Soil sampling was carried out from an average depth of 5 cm, since it is at this depth that plant roots actively develop [8].

Currently, the surveyed area is in the process of reclamation and natural restoration. Reclamation is carried out by planting trees, and natural restoration is associated with the process of succession under the influence of natural factors, without any special measures.

Statistical processing was carried out using the static analysis procedures of the Microsoft Excel application package.

RESULTS AND DISCUSSION

As is known, at present it is customary to distinguish three levels of environmental monitoring: a) global, monitoring the state of a slowly changing background, which is associated with natural changes in the biosphere as a whole, as well as changes that occur over vast territories; b) regional, reflecting the state of the environment within a relatively limited region; c) local, controlling processes occurring under conditions of intensive use of natural resources at a particular facility or local area.



The criterion for choosing the object of observation should be its high sensitivity to any changes in the natural environment, as well as the typicality of the object of observation, which must be statistically proven. Priority attention in carrying out environmental monitoring should be given to the synchronism and comparability of observations, as well as to the development of software system and technical support for monitoring.

One of the areas of environmental monitoring in the region of the South Aral Sea is assigned to observations of the state of soils, as well as their properties. It is known that salinity is one of the main characteristics of soils in arid regions, limiting fertility and determining their genetic and ameliorative properties. Salinity quickly responds to changes in natural conditions and anthropogenic impacts and is an informative property of the state of soils; therefore, in arid regions, it is monitoring salinity changes that makes it possible to obtain the necessary information about the processes taking place in soils. In what follows, for brevity, this system will be referred to as “monitoring of soil salinity.” It should be noted that the problem of organizing soil salinity monitoring is currently being widely discussed in foreign literature [5, 6, 7] and others.

At the same time, as I.N. Savin (2014), such a system for regular monitoring of changes in the salinity of irrigated soils has not yet been created [4].

Currently, work is underway to organize monitoring of agricultural lands in the South Aral Sea region. In connection with the extremely difficult situation on the irrigated lands of the Aral Sea region, developments to create monitoring of soil salinity in irrigated lands can be useful.

Depending on the depth of groundwater, the characteristics of the soil and the cultivated crop, the deciphering signs will change. However, for close reclamation conditions and one crop, they are stable, that is, having once substantiated the deciphering features with ground surveys and analytical data characterizing soil salinity, it is not required to refine the deciphering features during repeated surveys. But at the first stage, deciphering features must be substantiated by ground methods. Comparison of remote sensing materials that characterize the state of cotton fields and meet the above requirements make it possible to estimate the area of saline soils and the dynamics of soil

salinization in the territory occupied by cotton as the main crop in this region.

The experience of evaluating the dynamics of soil salinity by comparing satellite images of different years made it possible to state that to determine the direction of the salinization–desalinization process, images of a long-term series (5–10 years) are required, otherwise a wrong idea of the direction of the salt process may be obtained [2, 3]. Modern materials of high-resolution satellite imagery and modern computer programs for image processing, as well as the experience of previous years, allow us to solve the problem of creating a permanent monitoring of salinity in irrigated arid and arid regions of Central Asia.

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