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CREATION OF CARTOGRAPHIC BASIS OF DEGRADATED SAND DESERT PASTURE SOILS USING MODERN TECHNOLOGIES

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Abstract:

This article presents the results of research on the study of the impact of degradation processes on the agrochemical properties of desert pasture soils and the creation of various thematic maps using modern geoinformation technologies based on the obtained data.

Keywords: *Degradation, sandy desert soil, desert grasslands, geoinformation technology, digital mapping, humus, nitrogen, mobile phosphorus, exchangeable potassium*

INTRODUCTION. It is known that the prevention of pasture soils, the improvement of their production capacity is one of the most important issues of agriculture due to the prevention of degradation processes, maintenance and restoration of productivity. However, there are still problems on assessing and mapping the status of degraded pasture degradation soils in our Republic. For years, thematic maps in the form of paper were created as a result of soil research.

Today, the only way to use cards that protect this valuable archive data is the creation of their digital version using GAT technologies.

Delete intellectual data processing and use of GAT technology and information about the soil cover allows you to model soil degradation processes [5, 7]. The possibilities of this technology will increase in creating rounded experience models in the forecasting of degradation processes [3]. Forecasting of a degradation process based on GAT technology not only assessment of soil loss, but also to determine the spread area of erosion [6]. When gath technology is important in the identification and mapping of lands with high risk of degradation [9], as well as in the development of necessary measures for degradation. In the research conducted by a number of scientists as Sasbo [8], zdrulfi P., Paglari P., Kapor S., [10], Abrams M. [1], Erpul G., Erdogan H.E. [2], the clear mapping of land degradation processs was used by long distance remedy and used by GAT technology.

The development of measures is necessary to acquire reliable information on agricultural lands, efficient and rational use of them, to prevent anthropogenic adverse effects. For this, the use of new GAT technology for the use of modern technologies, especially in the limited conditions of grossary soil research, will lead the industry to a higher level and allow to achieve expected efficiency. Also, the initiator (preparation) and final (Cameral) stage processes will also be reduced due to the use of these technologies, the capacity of the performance speed, database, its renewal and processing will increase.

The use of this system in all fields, such as land resources management, maintenance and restoration of soil fertility is the most pressing issue. Applying the geographic information system in this area will provide analyzing the full information about a particular object or the development of the issues in a particular area, as well as to maintain sustainable soil fertility.

OBJECTS AND METHODS OF RESEARCH. The research was conducted in the sandy desert pasture in Konimex district of Navoi region. Field and laboratory research has been made through generally accepted standard methods. Profile-genetic, comparative-geographical and chemical-analytical methods were used in research. Soil analyzes were executed on manuals «Руководство по химическому анализу почв». The IDW interpolation method was used to create various cartographic models.

RESEARCH RESULTS. The determination of the various soil covering of various soil covers using modern geoinder programs and land remote sensing information is one of the most priorities of modern soil cartography. The application of these methods is an important role in addressing the diversity and structure of soil cartography and the development of the soil cover, as well as to address practical tasks such as agroecological evaluation.

Digital soil cartography is a new direction in soil science. Geodesic measuring instruments (GPS), digital models of the region (GAT) are used in the quantitative analysis of the soil cover and the resulting stage studies. The land is used to remote models of landscaping and other modern technologies and many positive results are being taken.

Based on the above, the programs of Arcgis 10.8.1, Geostistical Analyst (Ga), and Erdas Imagine 9.1 have been selected to create cartographic bases, depending on the experience of developed foreign countries of modern geo-explorat systems.

In determining soil fertility through the program model, it is possible to choose indicators for the definition of soil fertility between its properties and clearly characterize their productivity.

Several performance of the soil for analysis of the soil using the above programs (soil humus, mobile P_2O_5, interpreter K_2O, Nitrat-shaped Nitrate formation of nitrator $N\text{-}NO_3$) were selected. Through these selected parliaments, the digital maps of the soil were created in the ArcGIS 10.8.1 fields in the fields of Konimex district of Navoi region.

These indicators were chosen to be noted that the main agro-administrors of the soils were carried out and the analysis of the Arcgis 10.8.1 program was conducted through geoinical information through a geoonic analyst (GA) module. For this purpose, the geographical locations of key soil cuts were identified and the values of chemical and agrochemical results of obtained soil were made. Based on these, the spatial spread of the soil properties in the experimental field of the soil properties has been identified. One of the methods of existing interpolation in the Arcgis 10.8.1 program is used in the Geostatistical Analyst (Ga).

The amount of humus – Despite the lack of sandy desert pasture soils, its impact on the process and productivity of the soil is very high. The importance of humus is highly important in the formation of processes, changes and properties in the soil. Organic substances in the soil have the ability to collect and hold large amounts of nutrients and moisture due to the ability to absorb the water and the capacity. Therefore, it is important to determine the amount of humus as a factor determining the fertility of the soil.

Values were included in the amount of humus belonging to this part (Figure 1) to the relevant points to create a digital soil map on the amount of humus. Based on these values, the spatial spread of the amount of humus in the soil in the experimental field was determined. One of the methods of existing interpolation of the Arcgis 10.8.1 program is used in the geostatical analyst.

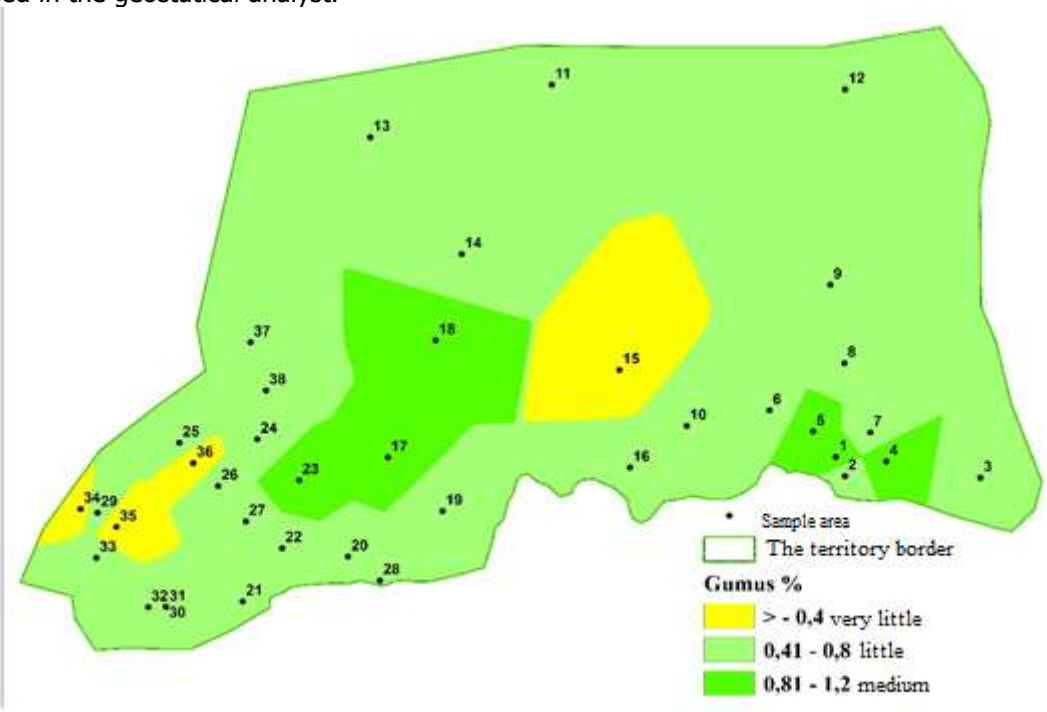

Figure 1. A map describing the spread of the amount of humus in the upper (0-30 cm) of sandy desert pilgrimage

Values to the field based on the valulations at the soil testing during this interpolation are founded in the field of spatial spread process and the result of the interpolation process, and the spread of the amount of humus in the top (0-30 cm) of the research process was created.

Mobile P_2O_5 – Phosphorus enters all of the bodies of plants, energy exchange - plays a big role in photosynthesis and breathing. Initial period of plant development, the intensive development of the acceptable phosphorian root system, allows the speed of the crop. Much of it is in the form of alkaline landetars, iron, aluminum phosphates. The maps for this property of the soil were also carried out in the order as described above. The Digital Care Scheme has been created in the soil of the research area P_2O_5 Maintrange Scheme (Figure 2).

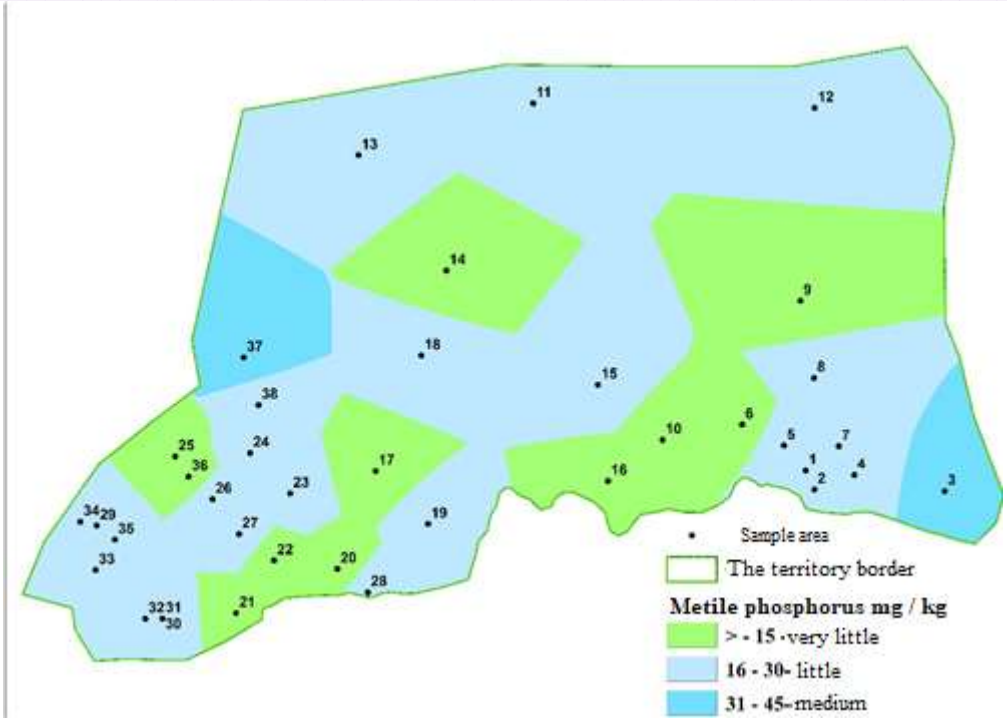

Figure 2. Map describing the spread of mobile phosphorus in the top (0-30 cm) of sandy desert piles of pasture soils

Metamulated K_2O – Potassiums increase that the weather can be able to resist the weather change, to freelance, and coldness, allow to strongly absorb nitrogen and the accumulation of organic matter in the structure of nitrogen. The source of potassium in the soil is the main gender. Although alluvial and prolecide, the deposits are rarely rare than leases, maintains a certain potassium amount.

Mapping in excedible potassium is also carried out in the above method and a digital card-scheme has been created in the upper (0-30 cm) layer of soils on Metamulated K_2O (Fig. 3).

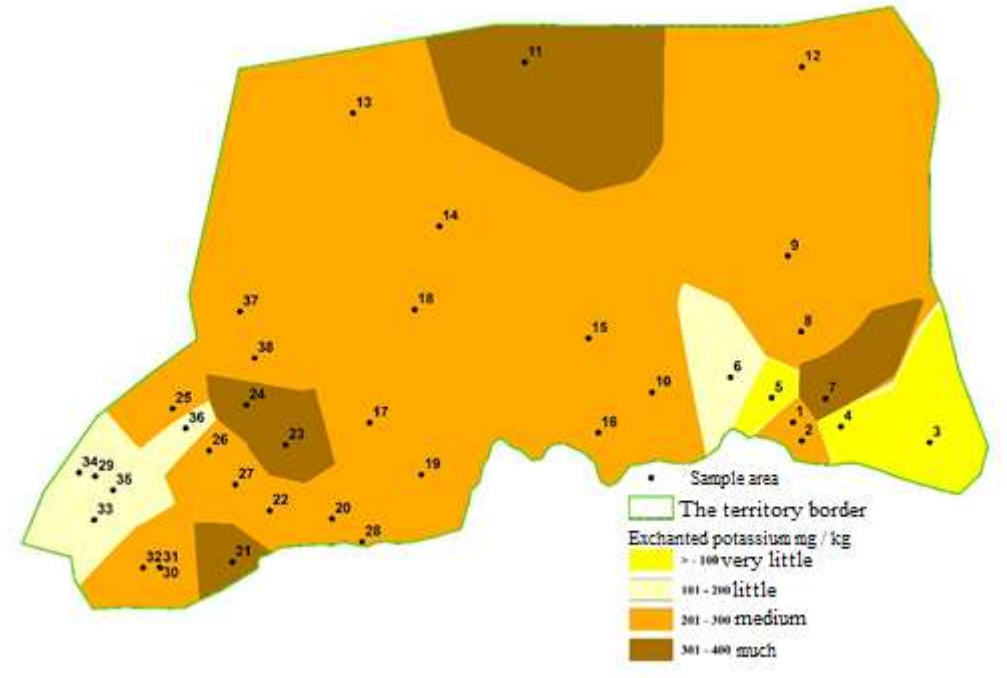

Figure 3. A map describing the spread of interpretable potassium in the upper (0-30 cm) layer of sandy desert elaborating

Nitrate (no3) is a natural form of nitrogen in the soil. This form of nitrogen is formed through the process of northialization through the transformation of the ammonium. Nitrate is used as food for plant growth and production. The amount of nitrogen-shaped nitrate in the soil varies in large quantities according to the soil tention, climatic conditions, precipitation and fertilization methods.

The amount of nitrate is observed in particular the mechanical composition of the soil. The amount is higher in heavy mechanical soils from light mechanical soils. As the nitrates are active, irrigation waters are washed into the lower layers of soil because of precipitation, which leads to pollution of the Suratforms of the Suratforms. Furthermore, through the derivation of anaerobic bacteria, nitrate is observed and lost to the molecular nitrogen. The objectives of preventing these cases should be carried out to improve the air properties of the soil and the hidding.

Nitritional amount of mapping in the form of nitrate is also created on the above methods and a digital map describing the spread of nitrate in the upper (0-30 cm) layer (Fig. 4).

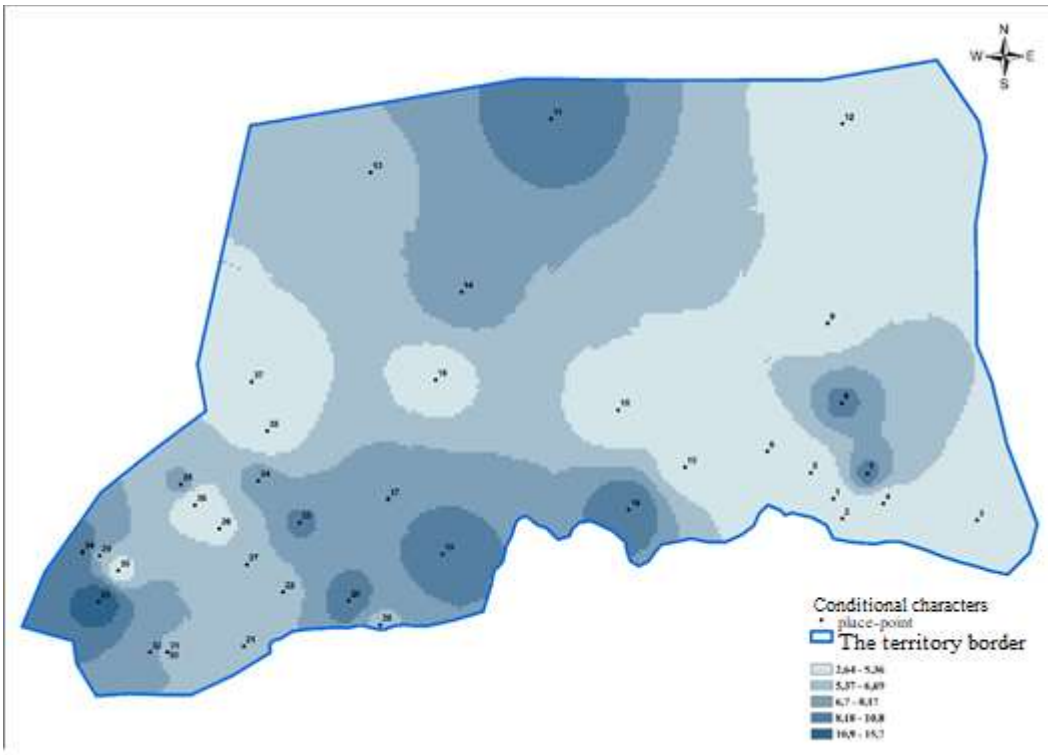

Figure 4. A map describing the spread of nitrogen nitrogen content in the upper (0-30 cm) layer of nitrate layers of sandy desert portrait

In short, on the basis of the results of research conducted in order to determine the survey of modern geoinformation, which is one of the most priorities of modern soil cart-information programs, a range of research was created on the basis of the results of research. Applying this technology creates opportunities for identifying, estimation and speed, data comparison, and savings and time saving when performing the status of soils and many years of monitoring.

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