

Development of a Methodology for Mapping the Cadastre of the World of Plants Using Geoinformation Systems

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ABSTRACT

In this article, the method of mapping the vegetation cadastre with the help of geoinformation systems is developed.

The technological process of creating cadastral maps of flora in GIS, the process of data entry and processing using modern methods is shown.

It is difficult to imagine modern landscape research without geoinformation systems. In recent years, along with the usual technology of creating landscape maps, which is called "paper", the computer technology of creating maps using geoinformation system (GIS) is developing rapidly.

In simpler terms, GIS is an automated hardware that provides collection, processing, storage, updating, analysis, and further processing of geographical topographical, land resources and other cartographic information about objects and phenomena of nature and society. it can be defined as a program complex (Raklov, Safarov, 2007).

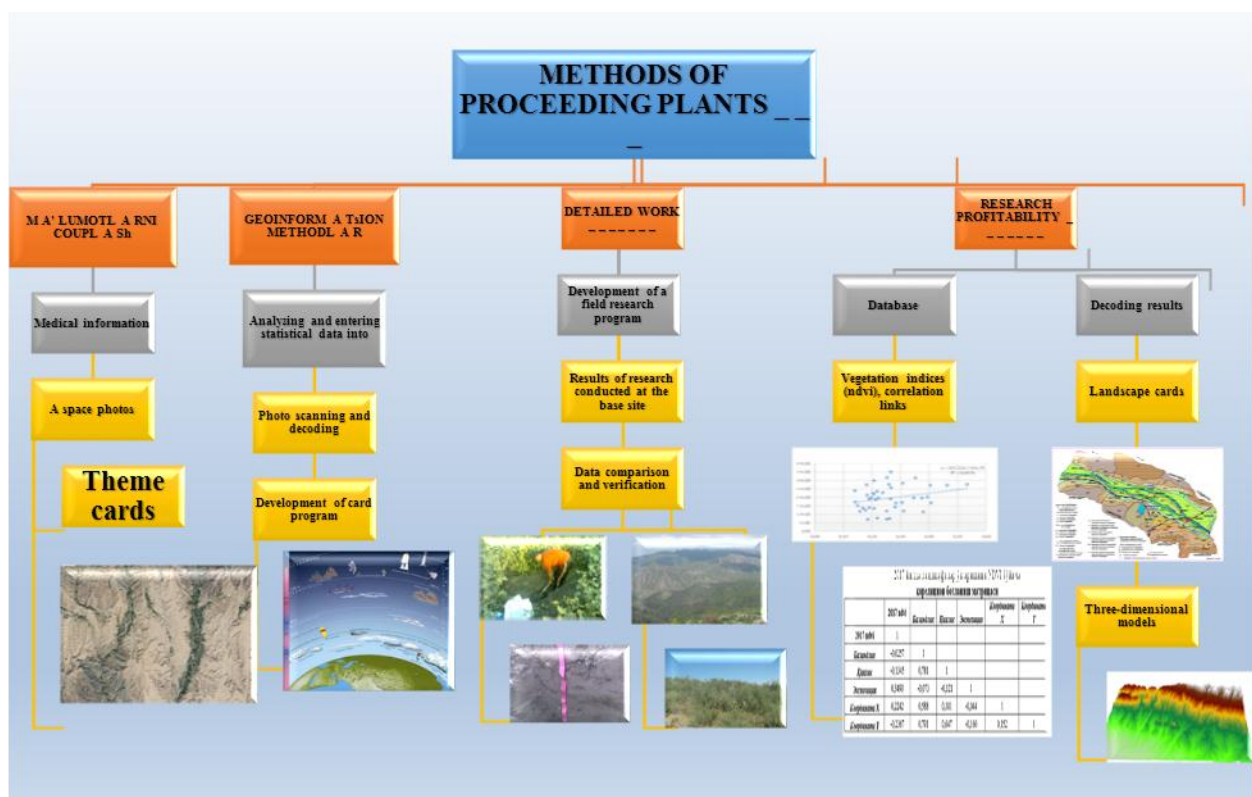
The diversity of the natural geographical conditions of our country has caused the formation of many landscapes, but the increasing impact of human economic activity on nature has led to drastic changes in landscapes. The Zarafshan Basin, where landscape studies were conducted, is one of the largest agricultural regions of Central Asia. Many branches of agriculture such as cotton growing, grain growing, horticulture, viticulture are developed in the basin. The use of modern research methods in studying the structure and characteristics of the Zarafshan basin landscapes from a natural geographical point of view plays an important role in their optimization . Taking this into account, the need for independent research of landscapes is

increasing.

The use of modern methods in creating landscape maps takes the main place in the monitoring and analysis of the processes taking place in landscapes, because in modern methods, the process of data entry and processing is fast [1]. Currently, Arc/Gis, MapInfo, ArcView, Win GIS, PHOTOMOD, Geo Draw, Geo Graph, etc. are widely used in creating landscape maps, conducting field research and production using geographic information systems. Landscape research in GIS software is carried out in several stages (see Figure 1).

At the first stage, maps, space photos are entered into the GIS base. For this purpose, data collected during landscape research, natural and previous landscape maps, space photos and statistics are stored in the computer memory.

For vectorization, a spatial coordinate system is selected in raster materials. This process can be done automatically or manually. Two base points are initially selected for automatic execution. All other anchors and control points are placed automatically. After that, space images of the basin are stitched together. Once the photos are connected, they will be digitized.



1. The technological process of creating cadastral maps of flora in GIS

In the last 40 years, information technologies have been developing rapidly and are increasingly penetrating into economic sectors. In particular, the importance of information technology in finding solutions to problems related to geography is increasing. Information technology has entered the geographic sciences in the form of geoinformatics and geographic information systems (GIS) and is acting as a powerful new tool for analyzing scattered geographic data (Berlyant, 1996).

The demand for GIS is explained by the following (Preobrazhensky, 1972):

- In recent times, the society's demand for geographic information has increased;
- The fact that information is becoming outdated very quickly and the need to fill it with new information;
- Quantitative increase in remote sensing data on the Earth's surface;

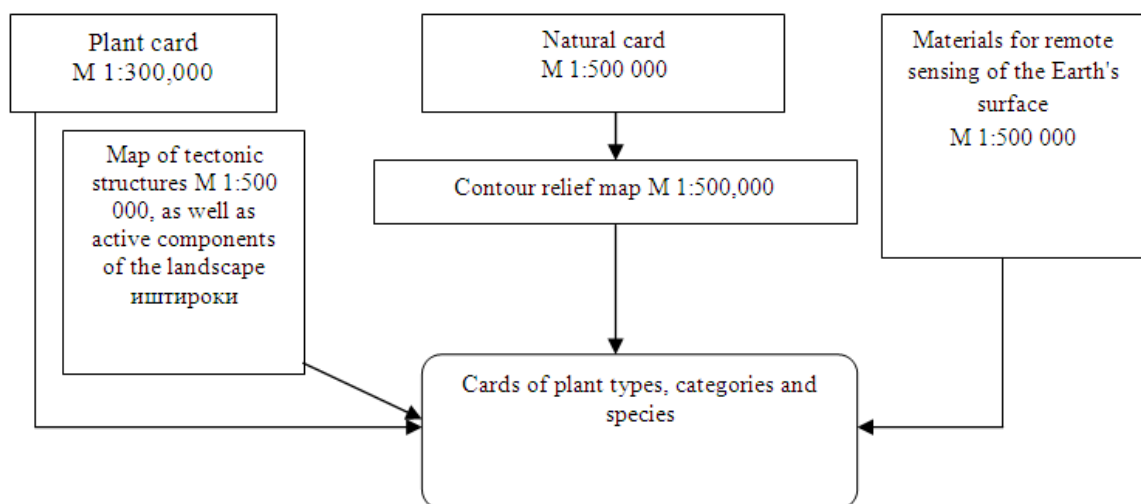
- Absence of perfect methods and forms of geographic information collection, storage and transmission;
- It is related to the trend of development of geographical sciences.

GIS was originally created in Canada by the Regional Planning Department of Geographic Information in collaboration with the federal government. The first task of this GIS was to record and classify Canada's land resources (De Mers, 1999).

The application of GIS-technology is of great importance in the cartographic, mathematical and statistical analysis of natural complexes in order to assess their geographical potential based on the landscape diversity of each region.

Field research, cartographic, aerial photographs, statistical, laboratory analysis, results of geographical comparison, landscape indicators and other materials are necessary to create a plant world database based on GIS. Therefore, GIS methods are carried out in conjunction with traditional methods used in landscape studies. However, GIS-technology differs from traditional methods by its technological steps.

When creating vegetation maps using traditional methods, a natural map of the area is taken as a basis, and the data of remote sensing materials, previously compiled vegetation maps, maps of Quaternary deposits, geomorphological maps are analyzed, and based on these, new A plant card is drawn up (see Figure 2).



2. In the traditional method of drawing plant cards data acquisition phase

Today, with the help of GIS, the possibilities of creating vegetation maps on an automatic basis have increased. For example, the results of automatic decoding of space images and a three-dimensional model of the relief can be used to study the distribution of substances and energetic erosion forms on the earth's surface, their dynamics and structure. A vector natural (topographic) map is used as a basis for creating landscape maps using GIS methods. After that, the prepared landscape, Quaternary deposits, relief, vegetation and soil cover vector maps, remote sensing materials are analyzed in GIS, the data is summarized, and a complex vegetation map is automatically created based on them (3- see picture).

GIS has the ability to collect all information about plants, analyze them in depth, monitor dynamic changes occurring in them and optimize them, create digital maps of complex processes in plants. If this system is used wisely, it will facilitate landscape research and ensure the accuracy of research results, and will serve as an important tool for quickly finding solutions to geocological problems arising in landscapes.

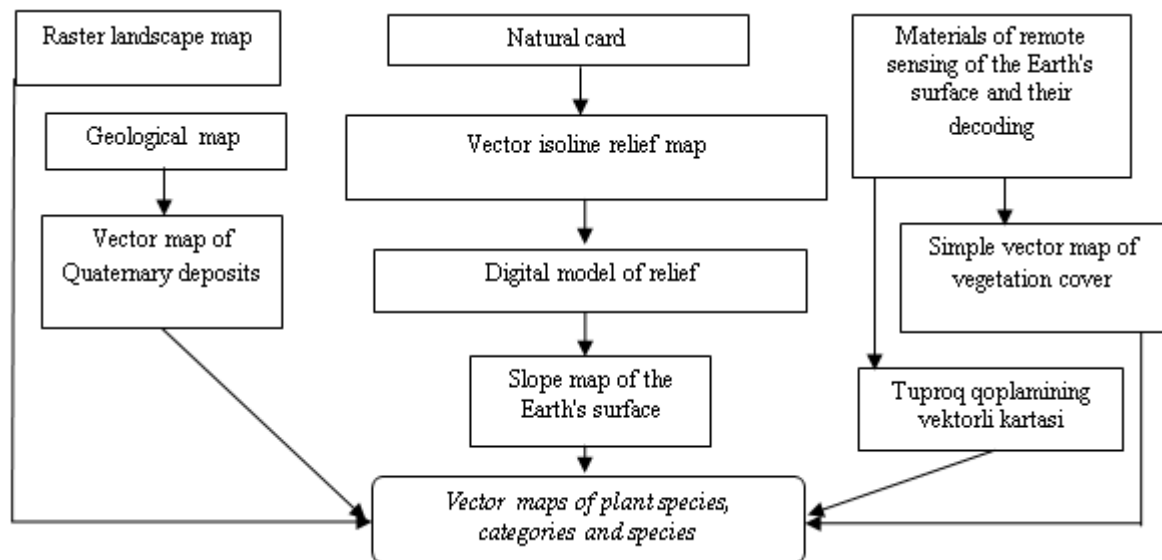


Figure 3. The stage of obtaining data in creating digital vegetation maps using GIS methods

The diversity of the natural geographical conditions of our country has led to the formation of many landscapes here. However, the increasing impact of human economic activity on nature is causing these landscapes to change dramatically. For this reason, the need to constantly research the flora, which is the main element of the landscape, is increasing. Plant cards are important in research.

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