LINKING THE ATTRIBUTIVE TABLES OF THE THEMATIC LAYERS IN THE GEODATABASE TO THE ALGORITHM

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Abstract: *The article shows the technical aspects, advantages and disadvantages of using the attributive tables of the thematic layers in the geodatabase with the algorithm today .*

Keywords: *GAT , ArcGIS, geodata, geodetic instruments, computer technologies, digital instruments, electronic tachyometers, modern innovative technologies, digital technologies .*

ArcGIS software has a specific model for working with data, especially spatial data, and this model is called a geodatabase. The geodatabase serves as the basis for storing all types of data used in working with ArcGIS applications, that is, the geodatabase acts as a repository for storing various types of data. With the help of a geodatabase, it is possible not only to effectively manage data stored locally or on a server, but also to create complex models in the process of working with different fields and projects.

When working with a geodatabase, users have the opportunity to work with two different models at the same time. These are physical and logical models. This ensures not only the geometric connection of objects, but also allows them to be connected at the object level.

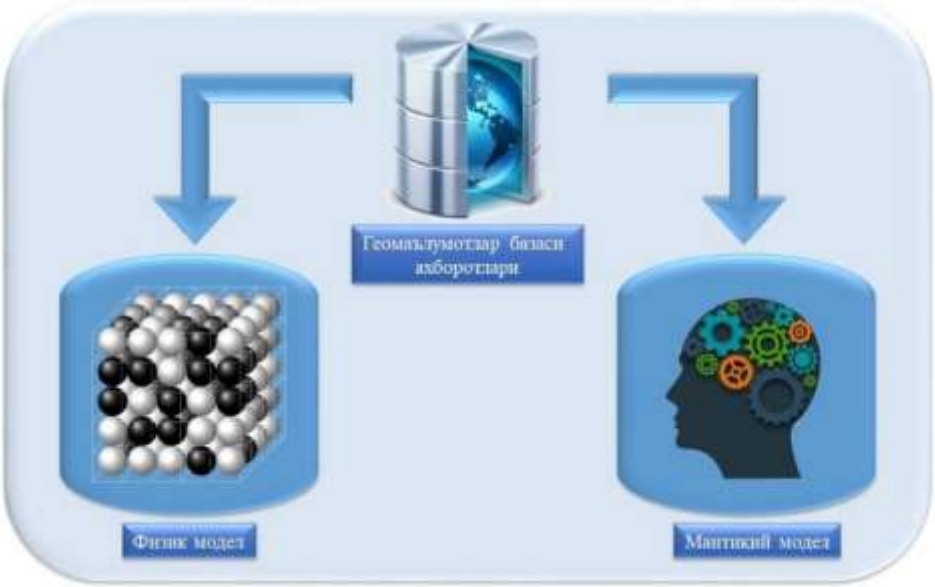

Figure 1. Geodatabase models

In a geodatabase, data can be stored locally, that is, on users' personal computers or on a server. There are the following options for saving the geodatabase:

file geodatabase – file folders on disk;

personal geodatabase – database in Microsoft Access (.mdb) file;

MBBS (Database Management System – Oracle, SQL Server, Informix, DB2 or PostgreSQL).

In geodatabase modeling, users can introduce some rules to be able to avoid possible errors and inaccuracies in the future. Also, there is an opportunity to correct errors made during data entry using special checking tools.

In a geodatabase, users can work not only with simple points, lines and polygons whose data is stored in tables, but also with real-world objects. For example, instead of points, they can work with transformers, and instead of lines, they can work with pipes.

Although there are many different scripting languages on the market of GAT software, we can single out three programs that are widely recognized: VBScript, JScript and Python. VBScript and JScript are considered by most people familiar with programming as simple programming languages. These programs are also designed to run in the Windows environment, just like the C programming language. Python programming language is an easy to learn language similar to C programming language. Additionally, Python can run on UNIX, Linux, Windows, etc., regardless of operating system.

A large amount of data can be stored in a geodatabase. For example, sheets of topographical maps can be stored not as a whole, but as a common thematic layer consisting of many sheets. In this way, most operators can refer to layers of such themed cards and edit them at the same time. It is also possible to create additional modules in ArcGIS using the visual programming language ModelBuilder or by writing scripts in a text-based programming language. Scripting in ArcGIS is a powerful technique that can be used to run simple processes, from simple to large to complex. Also, scripts are distinguished by their reusability.

Everyone who uses ArcGIS is required to write their own scripts to automate the workflow. Even someone who is not familiar with the programming language or its terms should be able to visually model their own weapons using ModelBuilder.

ModelBuilder is a sequence of algorithms used to create, edit and manage models. Models are connected to each other in a series of geoprocessing tools. In his scientific work, the author used ModelBuilder as a visual programming language for creating workflows.

ModelBuilder is very useful for creating simple and complex workflows and implementing automated systems.

ModelBuilder greatly facilitates the creation and implementation of less complex workflows, and also provides additional methods for the functionality of ArcGIS, which allows you to create and share concrete models as panels. In addition, ModelBuilder allows integration of ArcGIS with other applications.

In the ArcMap application, algorithmic work is carried out using the ModelBuilder panel for the qualitative management of agricultural land and modularization of the automated system. When performing algorithmic work, the sequence of commands is determined based on the rules of the program and modulated based on the use of thematic layers and tools in the ArcToolbox panel.

In order to implement modularization, it is necessary to automate the system of conducting field research work. Electronic digital maps created in ArcGIS software, which

belongs to the family of geoinformation systems, serve as a basis for the automation of field research.

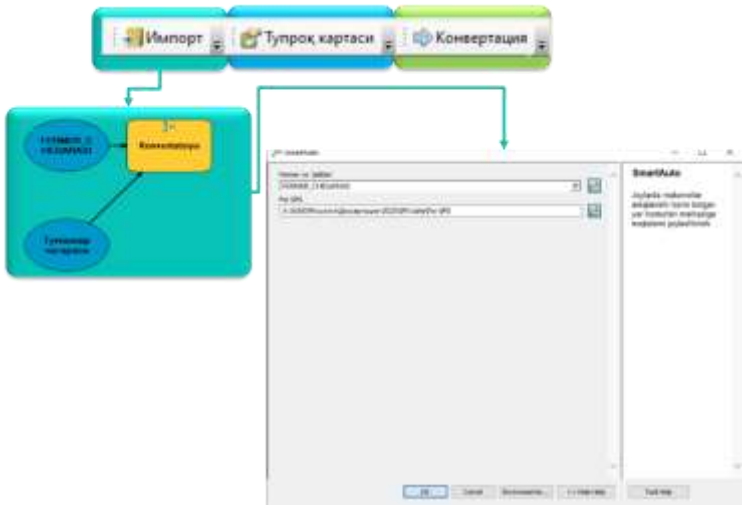

Fig. 2. Algorithm of automating the system of conversion of field research work into a geodatabase in ModelBuilder

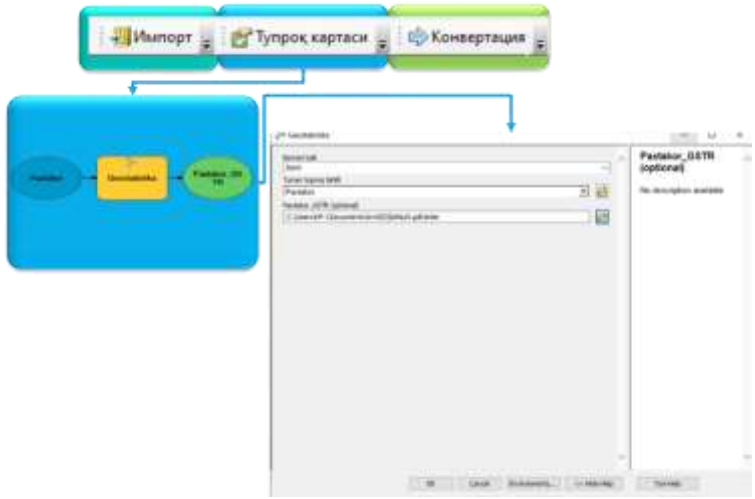

Fig. 3. Algorithm for automating the visualization system of soil differences in the geodatabase in ModelBuilder

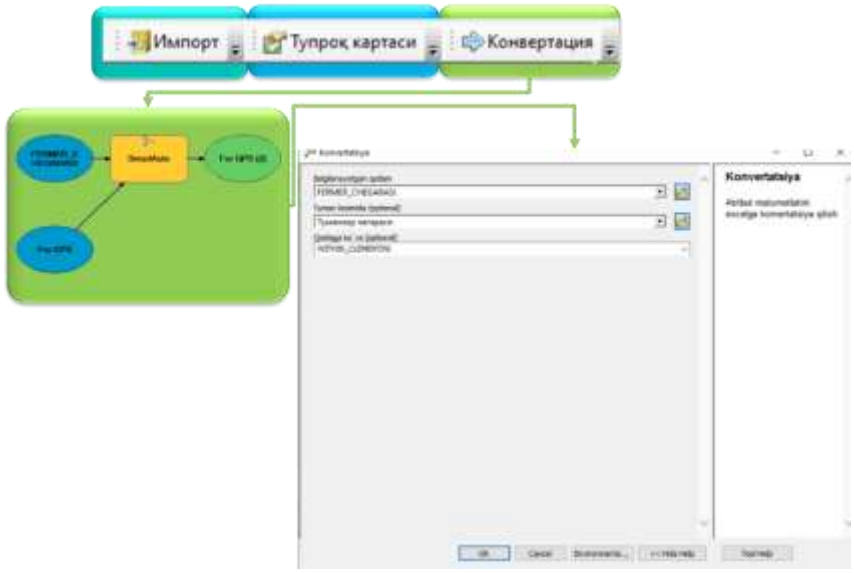

Fig. 4. Algorithm for automating the system of exporting analyzes performed in ModelBuilder to a tabular view

Land users and land contours are activated and the information of attributive data columns is visualized.

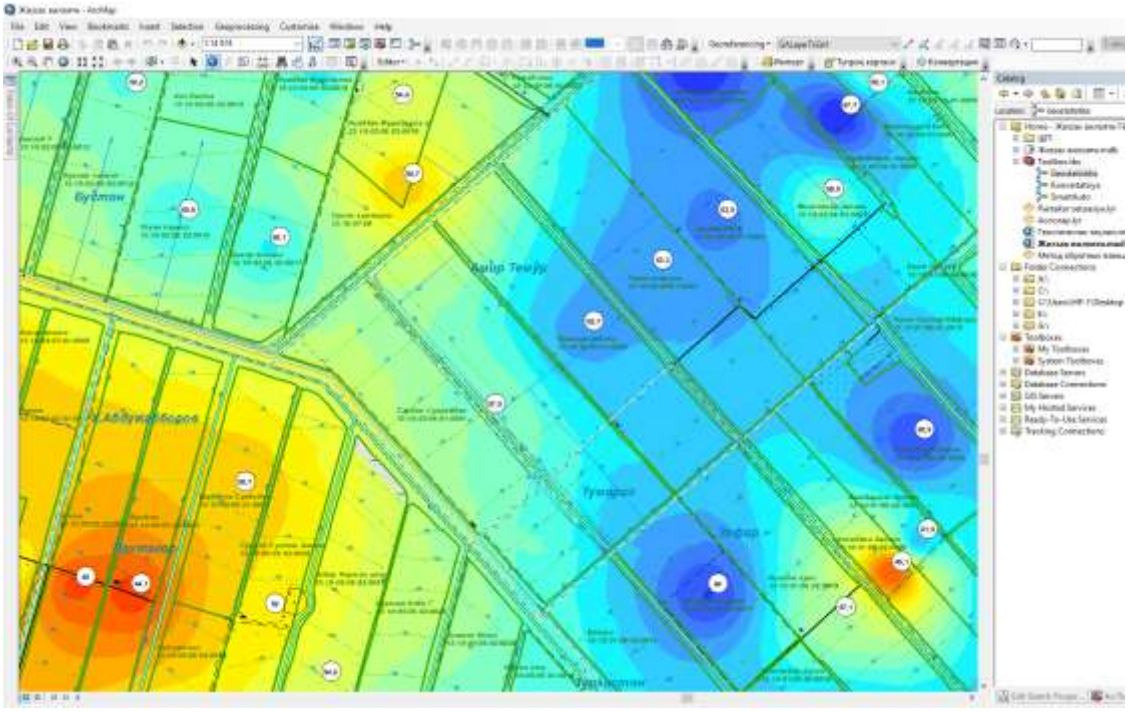

Figure 5. An ArcGIS software interface that visualizes land users, land contours, and soil quality scores

To investigate soil quality and classifications, point-view vector layers centered on common land areas of land users are uploaded to a GPS device. Soil analyzes are taken from points along the threshold defined by the loaded layers. The soil obtained in the field is analyzed and the results are sent to the geodatabase through the GSM network. The results are imported into the ArcGIS software and analyzed by the geostatistics module. As a result of the analysis, it is possible to automatically create the classification of RGB spectra and visualize soil differences using the quality color method according to the value of the soil score. These studies show that till now, soil separation is carried out mechanically by the "Soil Composition and Repository, Quality Analysis Center". In the works performed by mechanical method, the drawing of soil differences takes a lot of time, and it does not cause sufficient problems to regional land surveyors in issuing standard value estimates to land users. For example, we can mention that several soil differences fall on one land contour.

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