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IMPROVING THE WAY HOLSA MAPS IRRIGATED LAND USING GIS TECHNOLOGIES

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Abstract. This article reflects the need to take into account such important factors as lithology, relief, hydrography, climate when mapping irrigated lands using MapInfo GIS.

Keywords: MapInfo, GIS, lithology, relief, hydrography, climate, raster, vector, pixel.

Introduction. Making maps of the condition of irrigated lands requires great practical skills. In creating them should take into account not only the soil, but also some other components. In compiling them, important factors such as lithology, relief, hydrography, climate should be taken into account. Because the chemical and mechanical composition and condition of the soil depends on these factors. Currently, many scientific organizations are engaged in soil assessment. They have a database on soil salinity. Based on this information, maps are being created using the GIS. Making maps of the condition of irrigated lands requires great practical skills. In creating them should take into account not only the soil, but also some other components. In compiling them, important factors such as lithology, relief, hydrography, climate should be taken into account. Because the chemical and mechanical composition and condition of the soil depends on these factors. Currently, many scientific organizations are engaged in soil assessment. They have a database on soil salinity. Based on this information, maps are being created using the GIS. [1,2]

Material and methods. The main feature of MapInfo GIS is its popularity, ie the system: reading (viewing) and processing of graphic images; work with databases; search of the database, editing; construction of cartographic signs; drawing diagrams; has the ability to prepare and publish the card for publication.

The program has 3 types of windows for viewing data: text, cartographic and graphical. Multiple windows may appear on the monitor screen at once. For example: a planned cartographic window depicting the streets of the city to the user and the text window of the typical tables. the windows created on the screen are active. Another feature of the program is that the windows are directly connected to

each other, that is, if there is a change in one window, the other windows will change accordingly. If you select a graphic object and the corresponding text table entry, it will also be highlighted in the cartographic window, and vice versa, if you select the image of the cartographic window - it will also be highlighted in the graphic window. A text window is an electronic window in the form of a table with rows and columns. Each row represents a specific record, and each column represents that record field. The program allows you to add, edit, delete records. The user can select and resize the desired columns in the window. The cartographic window, like many other GISs, is used for layered imaging. The description of each layer can be displayed and edited as required by the user. The outer cartographic window is equipped like a text window. It has horizontal and vertical scrollbars to show other windows. The graphic window is used to work with point, line, surface and other types of objects. MapInfo software has advanced tools for creating reports, building graphs and charts, and developing statistical maps.[3,4,5]

Results and Discussion

The program is able to create themed cards, symbols and fonts. There are ways to create scales that reflect the qualitative and quantitative indicators of the object through the database. In addition, the program has the ability to create symbols of the cards, provide them with explanatory notes and, most importantly, edit the cards. MapInfo is a personal GIS in the information-reference category.[6]

Before starting to create a map, the specialist should have a clear idea of what the result will be, its scale, how many areas are reflected in it, which elements are primary and which are secondary, what is the level of detail, on what materials the process is performed, the characteristics of the area, etc. otherwise it is difficult to imagine creating a card.

Therefore, when creating a map in MapInfo, the editor makes a lot of editorial preparations. It is he who studies all the above questions and records them in the card program or in the editorial instructions. When creating maps in GIS technology, the data is digitized. Digitization is carried out in 2 different ways - by scanning and digitization of cartographic materials using special devices, and then by vectorization, or by vectorization of raster data.[7]

A raster image is a computer image of a picture, photograph, or other graphic material in the form of a set of raster points. A raster image consists of colored or black-and-white dots called pixels (pixels - image elements), and a vector image is created by defining the X and Y coordinates of a point in a coordinate system. On top of raster images you can place a card created in the program MapInfo.

In MapInfo, raster images are used for viewing only - they cannot be modified. Typically, they are used as a cartographic basis for vector maps because the level of detail in the image is much higher than for vector maps.

Although MapInfo does not communicate directly with scanners, it can easily read image files based on other programs. The raster image is created using a tablet scanner, which requires placing the cartographic source on the objective window of the scanner and performing the scanning process. A system of cartographic projections and coordinates is selected to spatially link (or record) a raster image and to vector it. [8]

To start in MapInfo, highlight the MapInfo icon twice (Figure 2).

Figure 2. Icon of the MapInfo program

After a few seconds, the "Start Session" dialog box "Start Session" will appear, asking you where to start the session (Figure 3).

If you have worked with MapInfo before, you can restore the status of the form until the last session. To do this, you can open "Restore the previous session", "Restore the previous session" or "Previous work set", "Previous work set" or other work set "Work set".

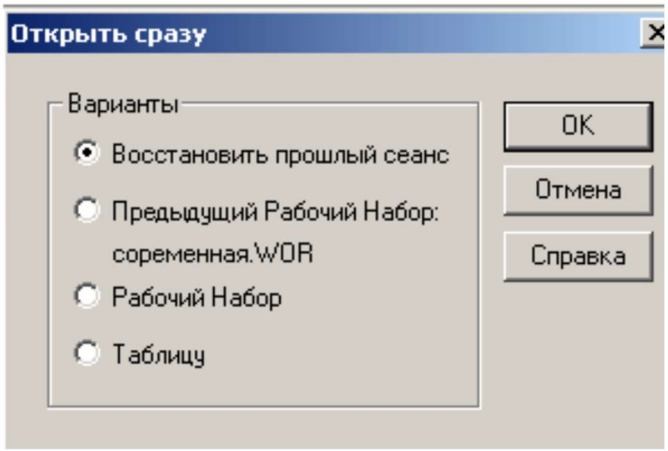

Figure 3. Startup dialog in MapInfo.

If you are working with MapInfo for the first time, you need to select the "Table" form "Table". When creating a new GIS program, you must also select Table.

At the beginning of the work the dialog "Open table" "Open table" will appear. It is necessary to refer to the folder where the raster image is stored according to the received task. In the dialog, select "File type - raster", "File type - raster" and "Image - active card", "Presentation - active card". The monitor screen displays a raster image specific to the region or business entity.[9,10]

When opening a raster image file, be sure to perform an operation called "Image Recording". An unregistered raster image is represented in the MapInfo conditional coordinate system and is for viewing purposes only. The process of working with such an image is not described in this manual, as it is not provided. After selecting the raster file and clicking "Open" and "Open", you need to answer "Register" "Register" (Figure 4).

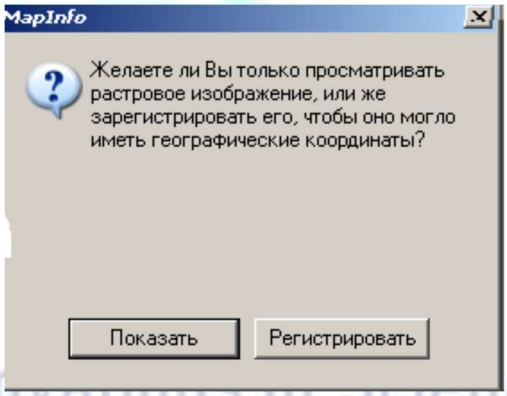

Figure 4. Registration dialog.

In the "Image Recording" dialog, you must specify the geographic coordinates of the base points (in MapInfo - checkpoints) in degrees (to the nearest 0.001) or their right-angled coordinates. To do this, click on the "Projection" button and select "Projection" in the dialog "Vibor proektsii" for the first case "Length / latitude" "Length / width" (Figure 5) for the second case "Plan - drawing" "Plan - scheme" (meters) is displayed (Figure 5.1).

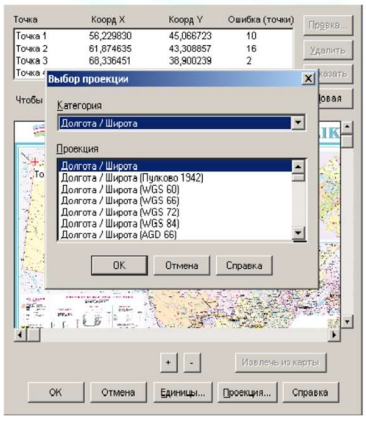

Figure 5. Base points

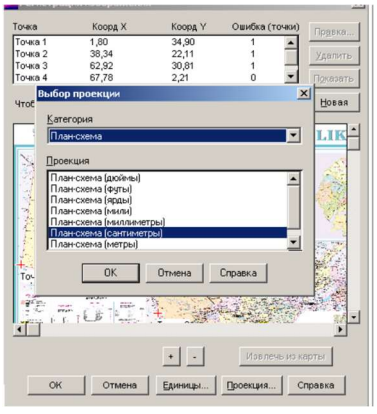

Figure 5.1. For base points

select the geographical coordinate

select the rectangular coordinate

If a 1:50,000 scale thematic map of an area is being created, a 1:25,000 scale topographic map will be used to determine the coordinates of the raster reference points, which will determine the coordinates of the raster reference points [10,11,12]. The reference points may be the intersection of topographic tour lines, turning points of land use boundaries, or the sign of the settlements represented by the point conditional sign. The "Add checkpoint" dialog "Add checkpoint" appears. In this dialog, the determined coordinates of the point are entered into the computer's memory using one of the methods described above. The control points in the image are numbered. Clicking OK will return the job to another point in the same order. The number of specified reference points should not be less than 4 (Figures 6 and 6.1).

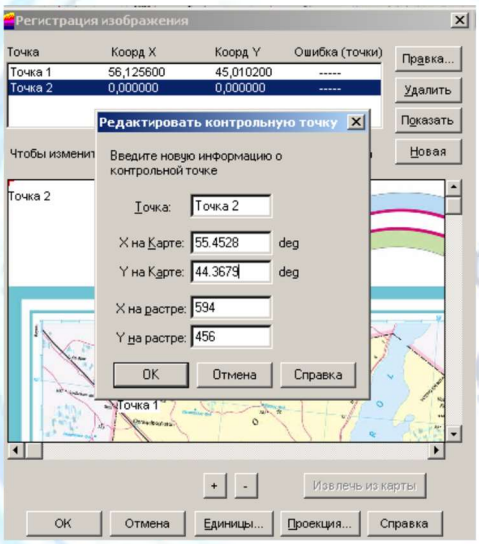

Figure 6. Base points are geographical coordinate selection process

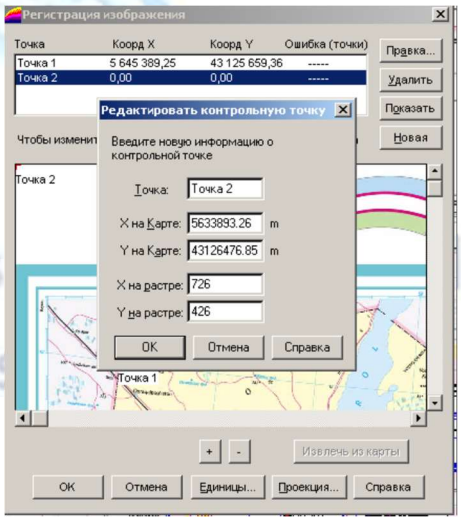

Figure 6.1. True for anchors the process of selecting the coordinate angular

If you need to make changes to the coordinates of the base points (due to a very large registration error), select the entry (about) at the top of the image "Registration" dialog "Registration" and remove it from the raster another point is selected or the determination of the geographical coordinates of the selected point is repeated. If the base points are carefully arranged, MapInfo displays the raster points without

spreading or twisting. When vector data is added, MapInfo ensures that the raster and vector layers are positioned correctly.[13,14]

It's a good idea to list the raster image once, because the next time the raster image file opens, it will open like any other MapInfo table.

To open a registered raster image:

1. Select the "Open Table" "Open Table" file.

2. TAV-file from the list that appears in the dialog (during registration)

Note: *The zoom of the image in the viewport can be changed using the "+" and "-" buttons. By zooming in, you can pinpoint the connection points. The raster image is moved using the "scroll bar".*

Select the table with the base file (for example: <Uzbekistan TAV> or <Samarkand tab>)

3. Leave the table type unchanged, because at the time of writing on the map, MapInfo (TAV-file) created its own tables in the form of a file that is easy to read.

4. Click "Open" and "Open". MapInfo opens tables with a rasterized image and displays it in a monitor window.

To set the meters in the coordinate system, the distances are in kilometers, and the areas are in square meters. It is necessary to measure in km. To do this, go to the "Map - Modes" menu "Map - Mode" and set the parameters in the appropriate places of the dialog.

Conclusion. Today, GIS is a powerful tool that has played an important role in managing data-driven regional development and the use of natural resources. Without limiting themselves to mapping and atlasing, they increase research and management productivity.

The development of GIS is largely dependent on data, hardware and software. The types of data and ways to collect them are increasing, they are improving in terms of completeness, accuracy, detail, modernity. One of the most pressing issues in our country is the creation of such a database, the establishment of exchange standards and its dissemination. Due to the joint use of GIS and geoposition systems, new opportunities are being created to increase the speed, accuracy and efficiency of data collection. Improvement of technical means, in turn, leads to an increase in the efficiency of the GIS. Over the past 10-15 years, the technical capabilities of the Internet, mobile communications, computers and data carriers have increased significantly. As a result, there are more and more ways to program, manage data, and create new types of geoinformation systems.

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