

Development of Digital Hypsometric Model of the Territory of the Research Object

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Abstract

One of the fundamentals of spatial analysis techniques based on digital gipsometric model is to develop maps angles. She got a wide application-from morfogenetical and geological-engineering perspective to the agrarian and spatial planning. Program ArcMap provides the ability to quickly prepare this type of cards based on raster model gipsometric territory in the case of the Republic of Azerbaijan, which examines technology create CGM using method Topo to Raster enables to develop raster layers CGM based on isolines.

Keywords: Terrain Display; Analog Cards; Earthly Landscapes; Vectorization Isohypse; Terrain; Factor; Erosion

Introduction

One of the most frequently used techniques of interpolation is a digital hupsometric model (CGM) model of this type is discrete presentation relief area, where each point is attributed to its absolute height. the next part the job is about technology create CGM method Topo to Raster. This method allows you to develop CGM raster layers based on identical so-called contour are the most common ways to display the topography of the territory on the analog cards.

Progress in the study and discussion of materials

Application of the method Topo to Raster requires previous victimization isohypse contour, with each attribute must match with the absolute height.

The method proposed here Topo to Raster is based on conditions that for most types of terrestrial landscapes main relief-forming factor are erosive processes, with the involvement of flowing waters.

Accordingly, in the relief of the territory has clearly expressed a certain skeletal shapes-line ranges or river valleys. For most types of relatively rare landscapes are endorsee deepening (except, for example, young postglacialnogo relief).

Method Topo to Raster, using iterative techniques, generates gip-sometric model in which laid territorial integrity surface runoff.

In the first stage, based on curvature lines displays a set of skeletal elements (lines, mountain ranges and river valleys), and then for the discrete points of space are generated by high-altitude data. If closed, you cannot define deepening in a separate layer algorithm will seek alignment interpolated surface to remove all endothecia zones (on the principle of providing solid surface runoff).

In addition to layers with izogipsami and drainless recesses CGM can be refined on the basis of additional information segments.

Them can be, for example, layers with high-altitude protesters. The method also allows you to use layers with the hydrographic of the territory, where there are rivers (linear layer) and a Lake (polygon layer). This method will make sure developing digital gipsometric model territory of Azerbaijan.

1. Create a new draft programs ArcMap.
2. For the development of CGM need at least three information layers that display identical so-called, the tall pickets and hydrographic network.
3. Select the Show/Hide ArcToolbox Window on the standard toolbar.
4. In the window box of tools (Toolbox) select Spatial Analyst Tool(s), then (MSU).
5. From the list, select toolbar method Topo to Raster. Window appears, shown in figure 1.
6. Using a list Input feature data, Choose necessary to create CGM information layers to be added to the table below.
7. Then in each layer, you must define the type of objects (for example, identical so-called or rivers) and in the «tall picket attribute values of absolute heights territory. Since Topo to the Raster uses identical so-called first and foremost, the program automatically triggers so that added layer is represented by contoured. Hence the emergence of the table boxes Typ next to the name of the magnitude of the Contour. In the graph Field designates an attribute with the value of the absolute height of the surface.
8. The lists of graphs Input feature Select layer with vysotymi this will help coat protesters to drill gipsometric model territory. Note that in the graph Type. After adding a layer to the table, you will see the value Contour.
9. Click on the graph Contour next to the name of the layer with high-altitude protesters. This opens the list of available for the graphs.
10. In a similar way in the graph Field designates an attribute with the value of the absolute height of the picket.
11. Using the Input feature, adding to the analysis layer table River near the river name change amount of box Type on Stream.
12. On completion of the add to the analysis of the layer with the boundaries of the territories of research. It will serve to define the spatial limits for analysis. Type Select the Boundary. Similarly to the previous case, for the layer of the River does not need attributes with high-altitude data.
13. Turn to graph Output surface raster, Choose localization and source name file. Name length must not exceed 10 characters, so it is better to use the Latin alphabet.
14. In the column Output cell size specify the dimension of the source image, expressed in units of card, or permitting capacity method. This value depends on several factors: the main purpose of is to create CGM, and hence the desired accuracy of the display.
15. For other parameters of the method, leave the automatic values. Press OK to start the settlement procedure. Depending upon the thermal design power of the computer, it should last no more than a few and less 20 minutes after the initial settlement layer will automatically be added to the image map. Because raster layers automatically open under vector, you can view the resultant maps close vector layers in the layer Manager window.
16. Change the display mode of the layer to a solid (stretched) and choose the color type that corresponds to the gipsometric images. The final effect of this work is visible in figure 2.
17. In conclusion, it is possible to note option Show Map Tips in the window with the properties layer. So you can keep track of change absaljutnyh surface heights, moving the cursor on the map.

Figure 1: Rice 3.1 Window method Topo to Raster.

Figure 2: Digital gipsometric model of Azerbaijan established the method of Topo to Raster.

Finished digital gipsometric model territory can be used for further spatial analysis, it will be discussed in the next section.

In the end we will try to improve the visual appearance of the raster map for greater readability. Use for the shadow effect.

1. Open the toolbar Spatial Analyst.
2. In the menu Spatial Analyst pick Surface Analyst, and then Hilishade opens the window that is specified in the figure 3.
3. In the window Hilishade in the graph Input Surface enter the name of the surface on which the shadow effect will be created because the project is currently only one raster layer, the program automatically will add it to the window.
4. The following two text boxes allow you to define the directions and angles of radiation. in both graphs are furnishing automatic size, but theoretically under Azimuth you can make a value from 0 to 359, while in the Altitude numbers from 0 to 90.
5. Box Z factor allows you to define the vertical excess for shadow effect automatically inserted value of 1 makes it impossible for this excess values greater than 1 are given the opportunity to strengthen the shadow the effect of that desire for territory with monotonous terrain.
6. Graph Output cell size plays a similar role as in the case of method Topo to Raster. When you define a permissive layer requires that you accept the resultant ability to value permitting ability that is identical to the largest primary segments. Therefore, in this box leave unattended.

7. In box Output raster introduce localization and source file name, and then choose OK, that will lead to the beginning of the settlement procedures. After productive layer will be added to the viewing.
8. Go to the window with the properties of the created layer and tab Symbology change the display mode of an out-stretched Standard Deviation.
9. The image improves the perception of the relief of the territory.

Figure 3: Dialog box Hilishade.

The effect can be deepened if simultaneously add range hypsometric colors. For this in the window with the properties of a layer turn to tab Display and then in the box Transparent enter the amount of 35 and press OK.

Effect of the gipsometric of the Azerbaijani model digital conversion is shown in figure 4 [1-8].

Figure 4: Image obtained due to overlapping shadow effect on a digital surface model territory.

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