Consolidated Block Diagram Guide Text

By

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There are several ways to get the block diagram product. This is just the way I did it, and includes several steps that could be useful and applied for other purposes and are not necessary to make the diagram. Portions of this guide incorporate NRCS Supplement: Introduction to Arc GIS 3D Analyst and the IFSAR tools Arc Map toolbox.

Models

- Add the Arc Map Toolbox "IFSAR tools" containing the "SRITB_elev_model_slope_shape_and_grad_reclass__Template"
    - This contains the base for the model to be built

- Open the toolbox. Right click "IFSAR tools, go to new, and then model. Create a new model. Rename this new one something such as "My_Model" so you know which one you are building in

- Right click on your model and click edit. You should see a blank model builder window pop up

- Right click on the "SRITB_elev_model_slope_shape_and_grad_reclass__Template" and click edit. You should see another model builder window pop up

    - Click on the portions of the template you want, copy them and paste over into your model.
        - You can also right click in your blank model and create your own variables

    - Either way, once you have several variables use the connecter tool (Fig. 1.) to get the "cursor wand". Use the wand to make connections between your variables. You can also drag and drop toolboxes and connect your input file to toolboxes for example as is shown in Figures 2 and 3.

    - Figure 4 is the model that was created to make files for block diagrams; all that was used from it was the produced hillshade. However, other created files (aspect, slope, etc.) could be useful.

    - "P" denotes a model parameter, right click on the variables you want to be parameters and click "model parameter" and they become parameters (Fig. 4 and 5.)

    - After you decide what you will want to look at (files that will be useful to you) right click on each produced file in the model that you may want. Make sure that the file pathway saves it where you want it to. Otherwise, by default your files will end up in a "temp folder".

    - Direct the model to get the file for analysis that you chose. Do this by right clicking in your model where I have "N32W100G7". Validate and run the model. You should see each variable highlight red as it validates and runs. Figure 5 is what the model should look like after running.

Block Diagrams

- Add the elevation, hillshade, and image data you want to work with to an ArcMap mxd, and decide which area you would like to work with, cut it down to a more manageable size.
    - Sometimes what looks good in Arc Map does not look as good in Arc Scene

- Create a "feature class" (make sure you specify the projected coordinates)
    - Select your output location "Created_files", name the file "Block_Deliniation"
    - Geometry type should be **polygon**
    - Use a soil MU layer as the template (any county will work, as long as you select one in the **same coordinate system**).
    - **Set the coordinate system the same as the data you will be working with** (do this by manually selecting it or import it from the elevation file you added).
    - Click OK

- Begin an edit session and add the SRITB Edit toolbar or use the Edit tools on your own toolbar.
    - Task is create new feature and target is the feature class you just created
    - Select the sketch tool, and rectangle tool (you can however make any shape you would like)
    - Draw your shape
    - Stop editing and save your edits
    - Use "extract by mask" on your elevation, hillshade and image layers masking by the "block delineation" that you created
    - Make sure you direct the files to where you can find them
    - Remove the "full layers" leaving only your "extracted layers" behind

- Create another feature class or add in your existing soil lines
    - If you are going to interpret lines make this feature class in the same manner as the previous one you created except this time name it "Created_Lines" and make sure the geometry type is **polyline**
    - Begin an edit session (task is create new feature) (target is "Created_Lines")
    - Select the sketch tool and streaming
    - Draw your lines where you want them and be sure to go outside the "block delineation" line (Fig. 6.)
    - With the line or lines you have just drawn selected, select the smooth tool
        - It will ask you for an offset, start small like 1 or 5… get too carried away and your lines will overlap and/or be too generalized
    - Clip the "created lines" by the "block delineation"
    - Open the attribute table of the "created lines" feature class and select individual or groups of lines representing the soils you want to illustrate
    - Right click on the on "created lines" in the table of contents and export data (selected features) as a layer
    - Do this for each line or group of lines you want in your block diagram
    - Save this mxd as Block_Dia_BaseFiles (or the equivalent) and close

- Open an empty Arc Scene sxd
    - Add your soil lines, interpreted lines, imagery data, elevation data, and hillshade that you have extracted and edited. Also, add any other layers that you may want
    - Right click on each layer you added and go to properties. Select the base heights tab and **set each layer to (obtain heights for layer from surface: elevation data)** *I used IFSAR for mine*

- After you do this turn off your elevation and hillshade layers and you should end up with an image similar to figure 7
    - If you want, you could instead change the color ramp of the elevation layer then adjust the transparency of the elevation and hillshade layers and leave them on (sometimes this looks ok) similar to figure 8
    - Change up the image how you think it looks best
    - Right click "Scene layers" select "Scene Properties" and the General tab
    - Enter your "Vertical Exaggeration" or click "Calculate From Extent"

- Expand or narrow the view and select the "Navigate Tool"
    - Move the image around until you get a view that you like
    - Select "File" "Export Scene" "2D" (Fig. 9.)

- Select a location for this image, name it and save as a JPEG
    - You can adjust the resolution, however 500dpi seems to work well and going much higher creates a very large file and causes problems later on

- Open an empty Arc Map mxd
    - Click "Add Data" and navigate to where you saved the JPEG from Arc Scene and add it (a window will pop-up asking if you want to build pyramids, click yes)
    - Add each layer you wish to symbolize too (i.e. soil lines, created lines, etc.)

- Change to "Layout View"
    - Insert legends, graphics, etc
    - Your ArcMap mxd should now look similar to figure 10
    - Once you get it situated the way you want it
    - Click "File", "Export Map" and save it (all settings are the same as the previous JPEG you created, but make sure you name it so you can tell it apart from the previous JPEG)

- Open an empty Power Point presentation
    - Click "Format", "Slide Layout", "Content Layouts", and select the "Blank" slide
    - Navigate to your saved JPEG
    - Right click on the file extension and select copy
    - Right click on the **small "outline view" slide and select paste**
        - You can now enlarge, reduce, and crop just like any other photo
        - Right click in the blank area of the standard toolbar and turn on the drawing toolbar

- Click "AutoShapes", "Lines", and "Line"
    - Draw all your straight lines
    - Select one, then hold down CTRL and click all of them
    - Right click on the selected lines and select "Grouping", "group", then select "Order", "Bring to Front"
    - See figure 11

- Select “AutoShapes”, “Lines”, “Curve”
    - Draw a curved line roughly larger than the area you want to illustrate and adjust the fill transparency to around 50%
    - Right click on the line and select “Edit Points”
    - This will bring up vertices that can be moved, added, deleted
    - See figure 12

- Draw individual curved lines for each area you wish to illustrate (Fig. 13.)
    - In the “Properties” of each line you can edit … fill, transparency, load photos to fill the lines, line thickness, color, etc.
    - Overlap the photo slightly and it will cover most of the jagged edges
    - If part of your vertical lines disappear behind something you have drawn just right click them and re-set their order to front
        - The Tablet PC works very well when hand drawing these lines (but it can be done with the mouse as well)
    - Add in any labels to the figure
        - Text boxes can be rotated if you select their “Properties”, also you can fill them, outline them etc.
        - Arrows and other shapes, lines, callouts, etc. can be found under AutoShapes in the drawing toolbar

- Additional notes
    - Many other features of the lines, text boxes, etc. can be edited and changed by right clicking the feature(s) and selecting the “Format AutoShape” tab
    - Keep a close eye on “Grouping” and “Order” of the features (grouping selected features will help manage the different features you create, changing the order of the features you draw can change the finished look of the figure)
    - If you want to put your created figure into a Word Document for example, “right click” the small outline view of the slide select “Copy”, go to the document you wish to place it in select “Edit”, “Paste Special”, paste the figure as a “Picture (Enhanced Metafile)”
        - By pasting as an Enhanced Metafile you can then crop and resize the image reducing the chance of quality degradation
    - When moving your curved line vertices around the angular corners of the block diagram the curved line will try to continue the curve…. You can make a right angle with a curved line it does take a bit of practice though

Consolidated Block Diagram Guide Figures

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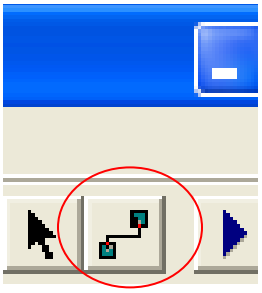

Fig. 1. IFSAR tools, model builder connector tool used to get the "cursor wand".

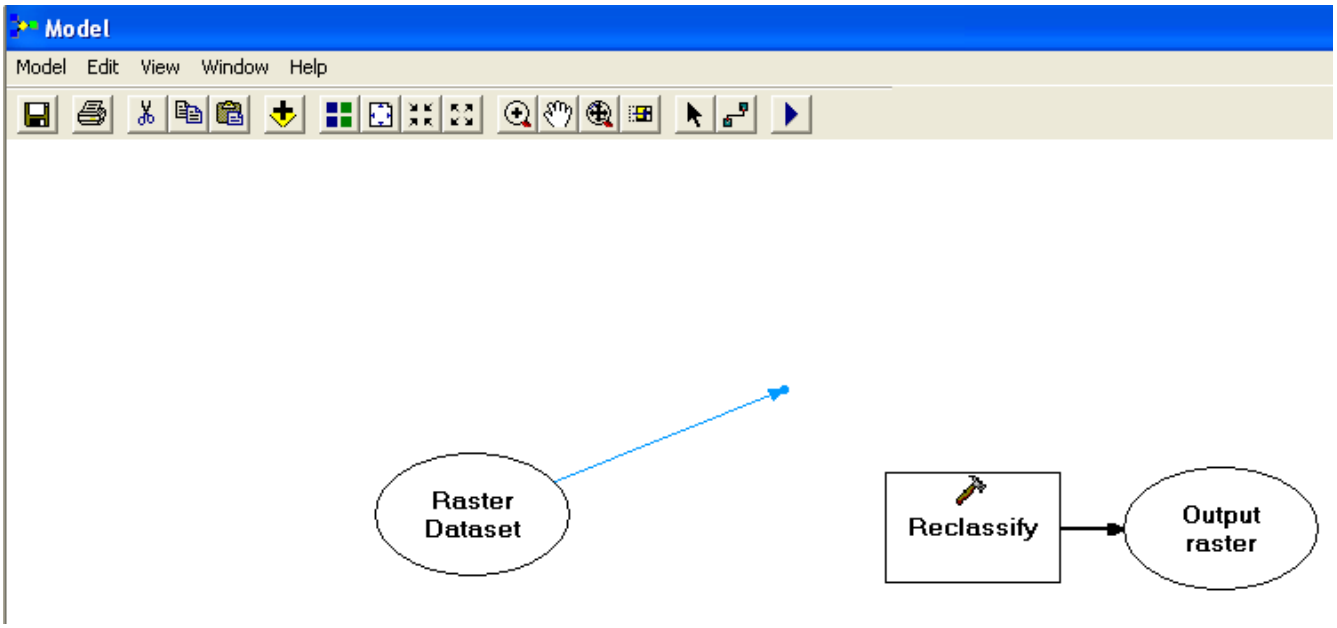

Fig. 2. Using the "cursor wand" to connect an input file to a toolbox.

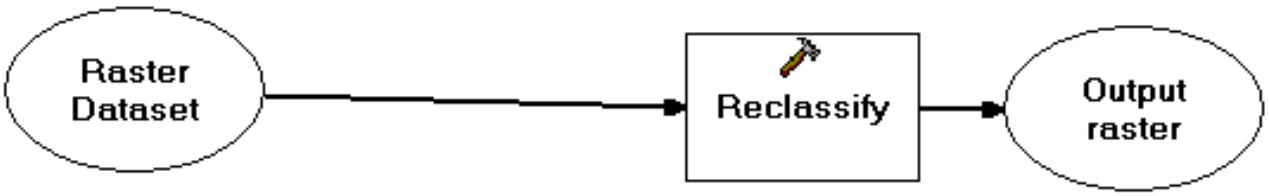

Fig. 3. After connection has been made between input file to toolbox.

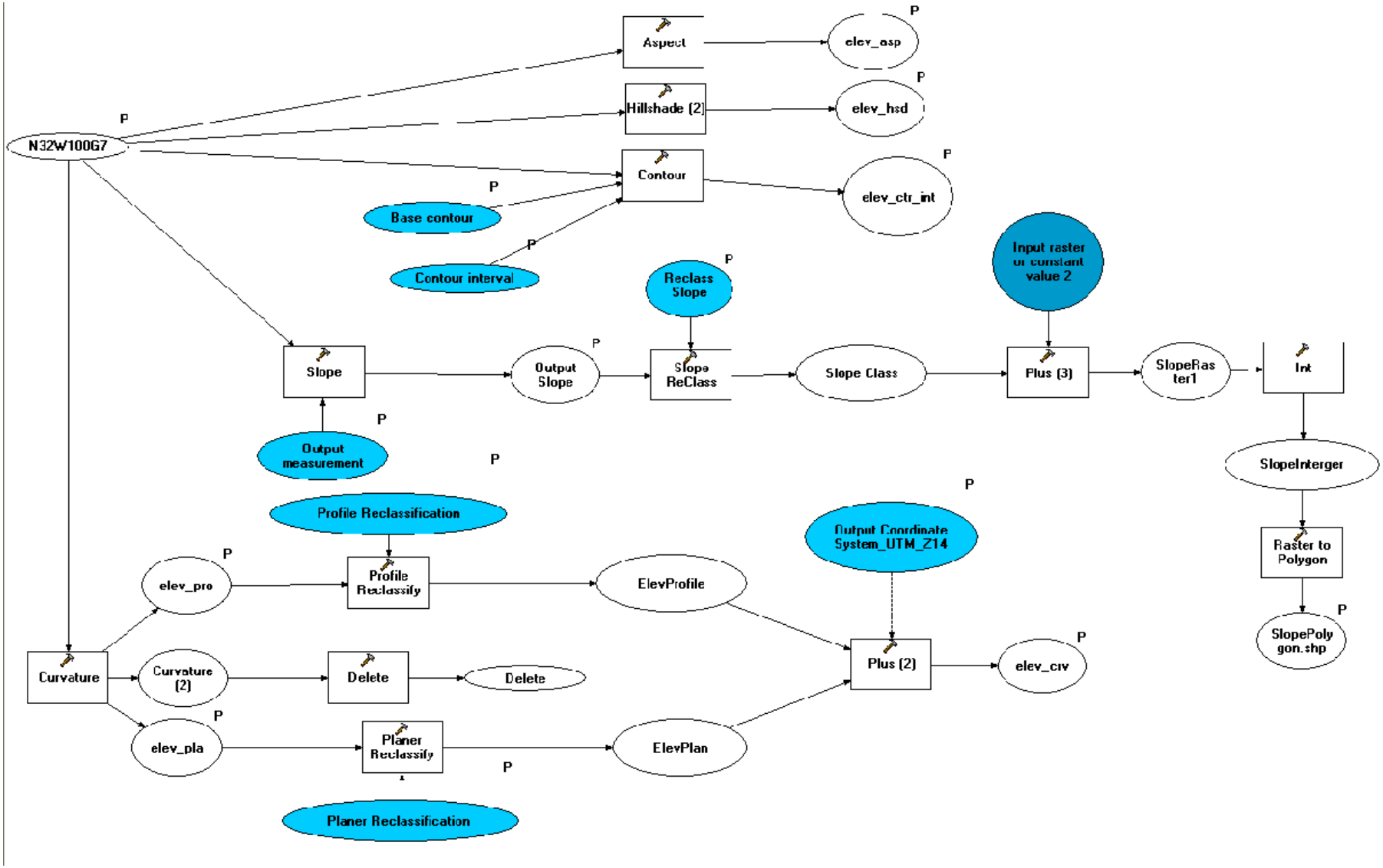

Fig. 4. Model that was created to make files for block diagrams.

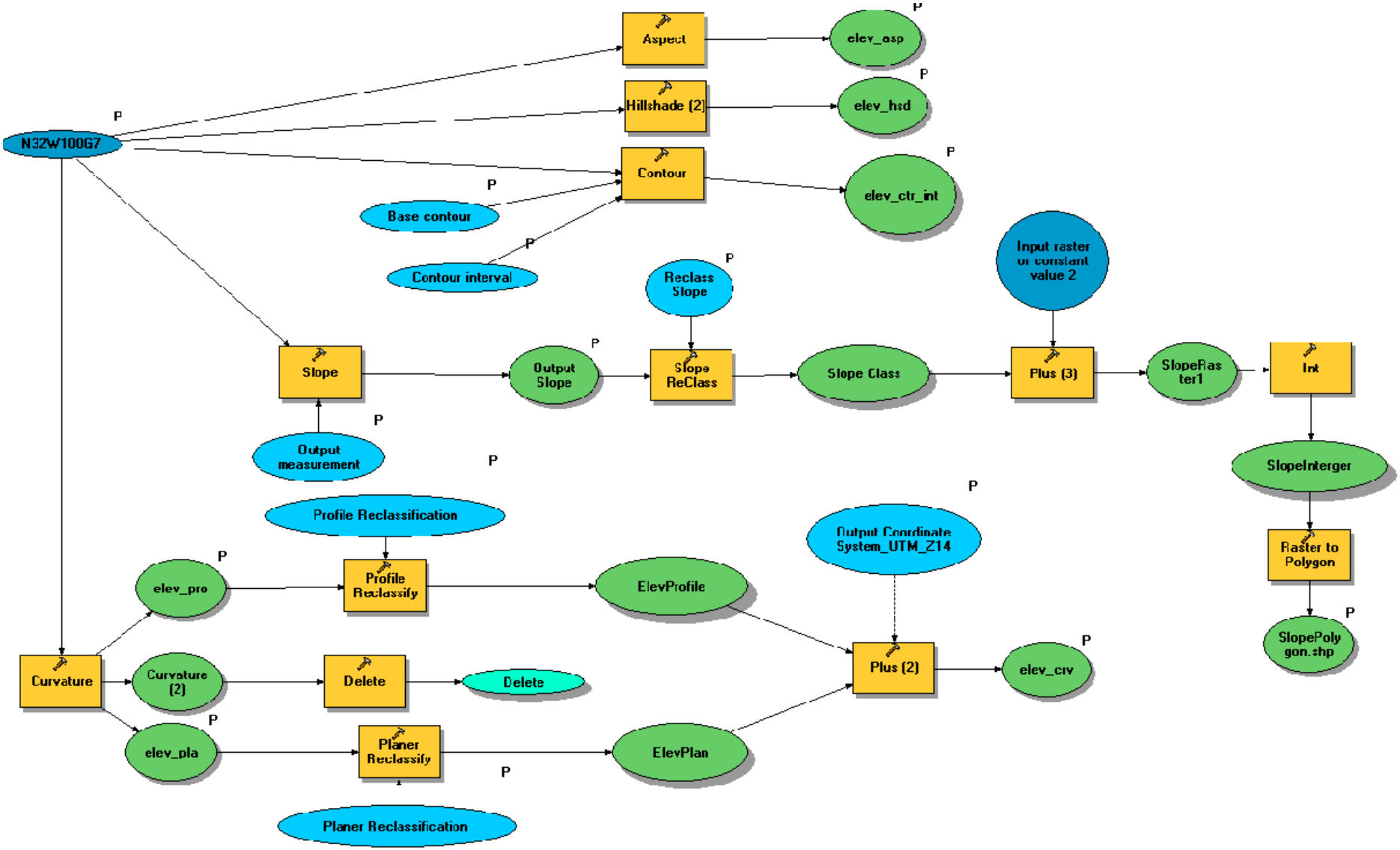

Fig. 5. Created model after running.

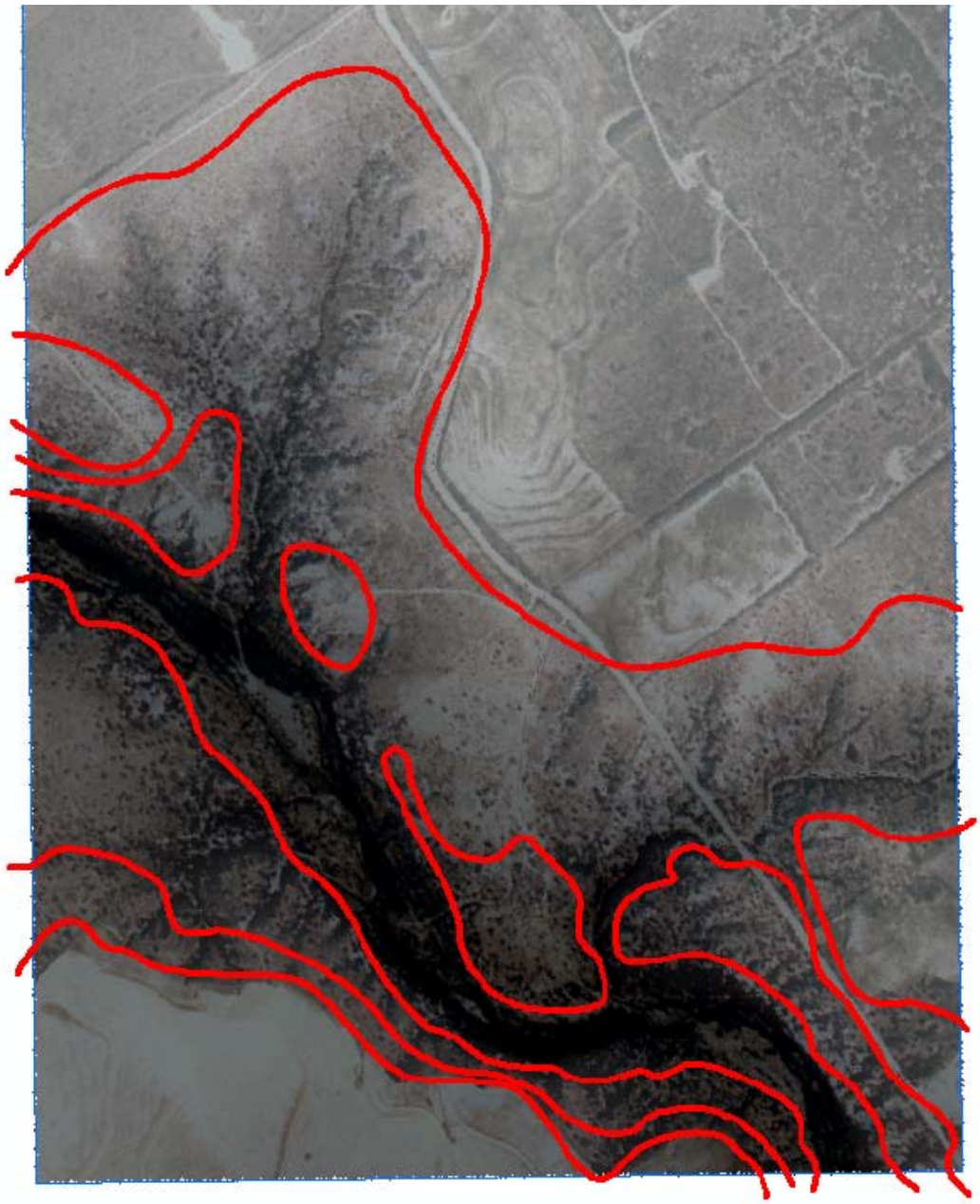

Fig. 6. Interpreted lines created (red) and drawn go outside the “block delineation” line (blue)

Fig. 7. ArcScene image with interpreted lines and imagery using IFSAR for base heights.

Fig. 8. ArcScene image with interpreted lines and imagery using IFSAR for base heights, transparency and color ramp adjusted.

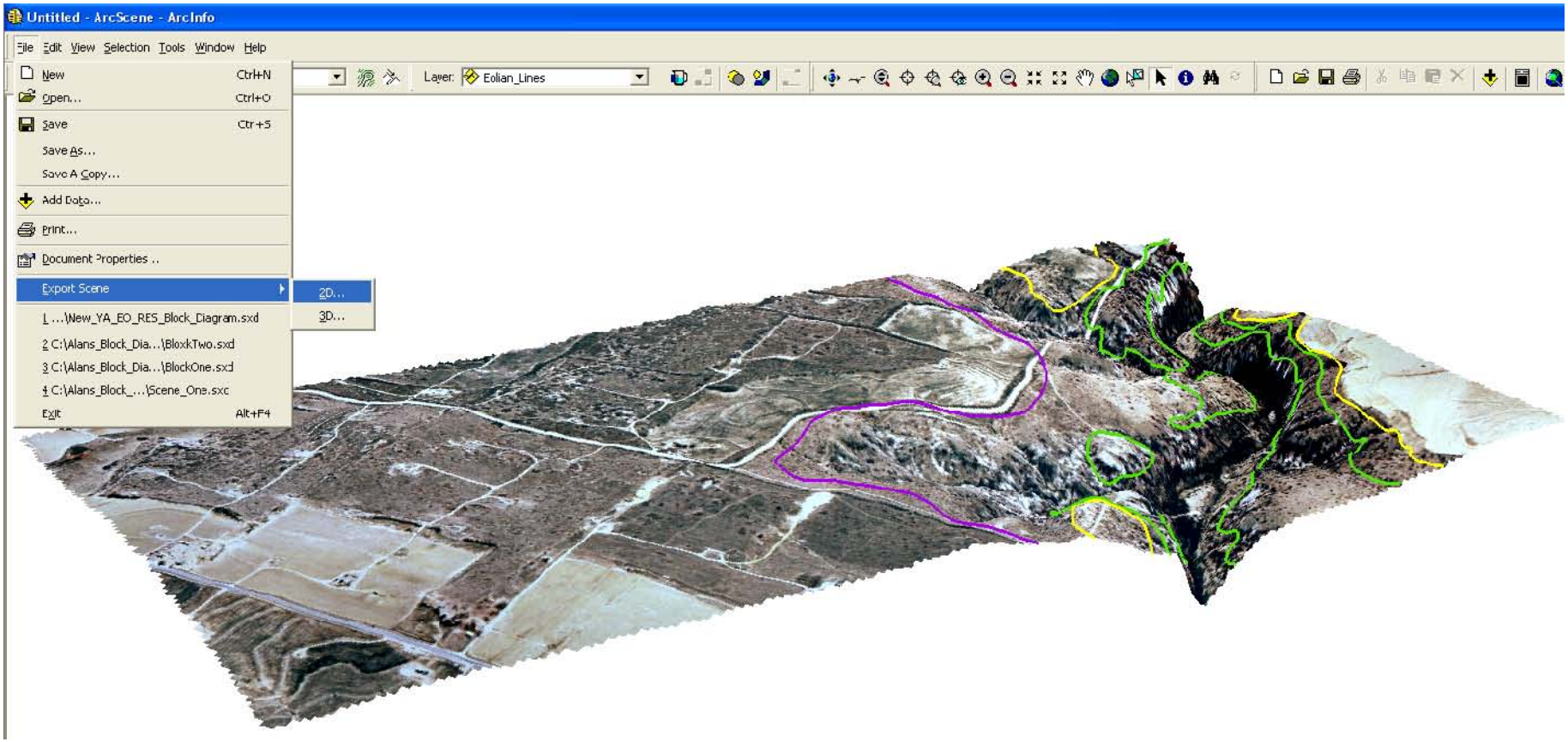

Fig. 9. Vertically exaggerated image being exported as 2D JPEG.

Fig. 10. ArcMap mxd layout view image with graphical legend added.

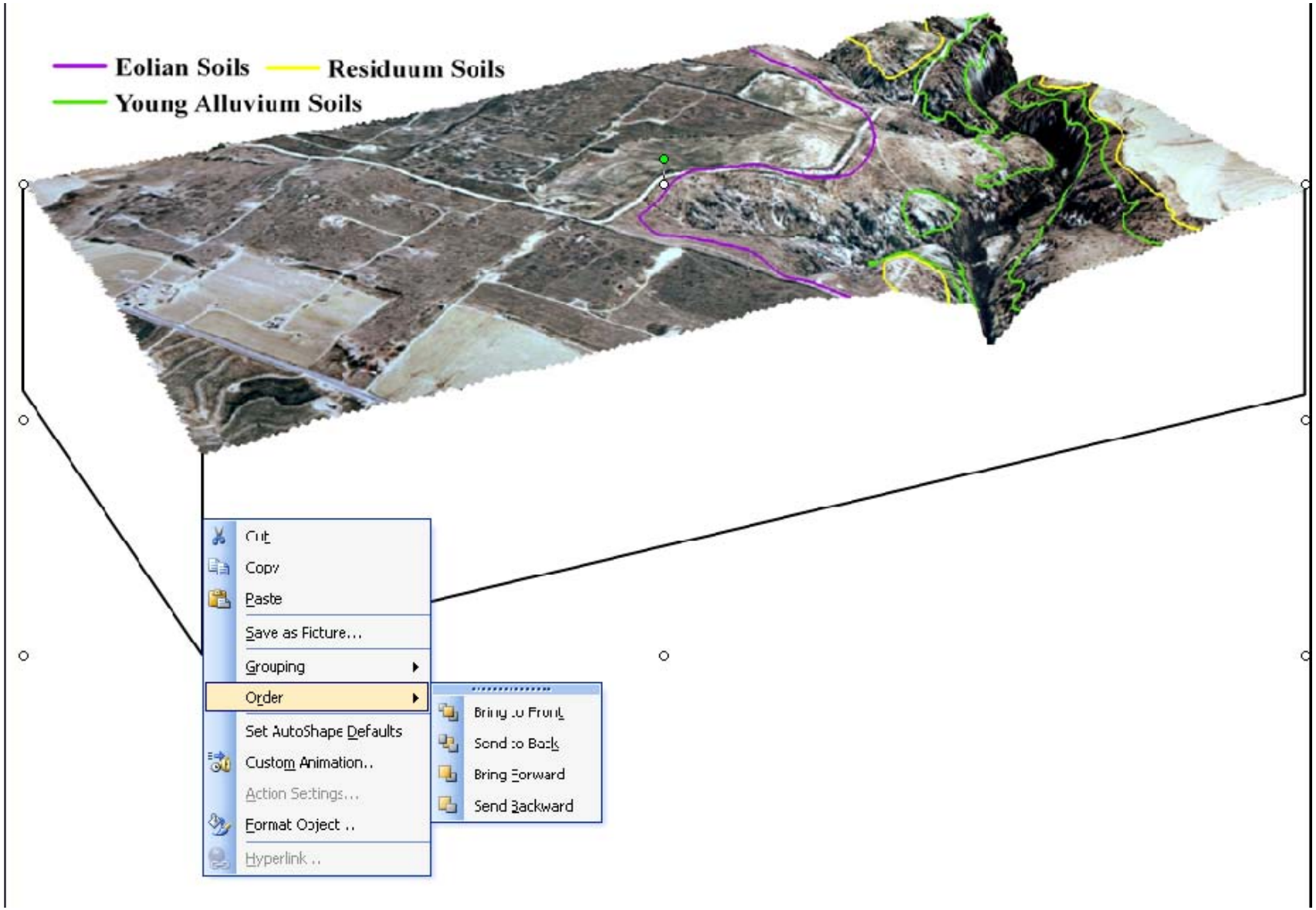

Fig. 11. Straight lines drawn for block diagram and being grouped.

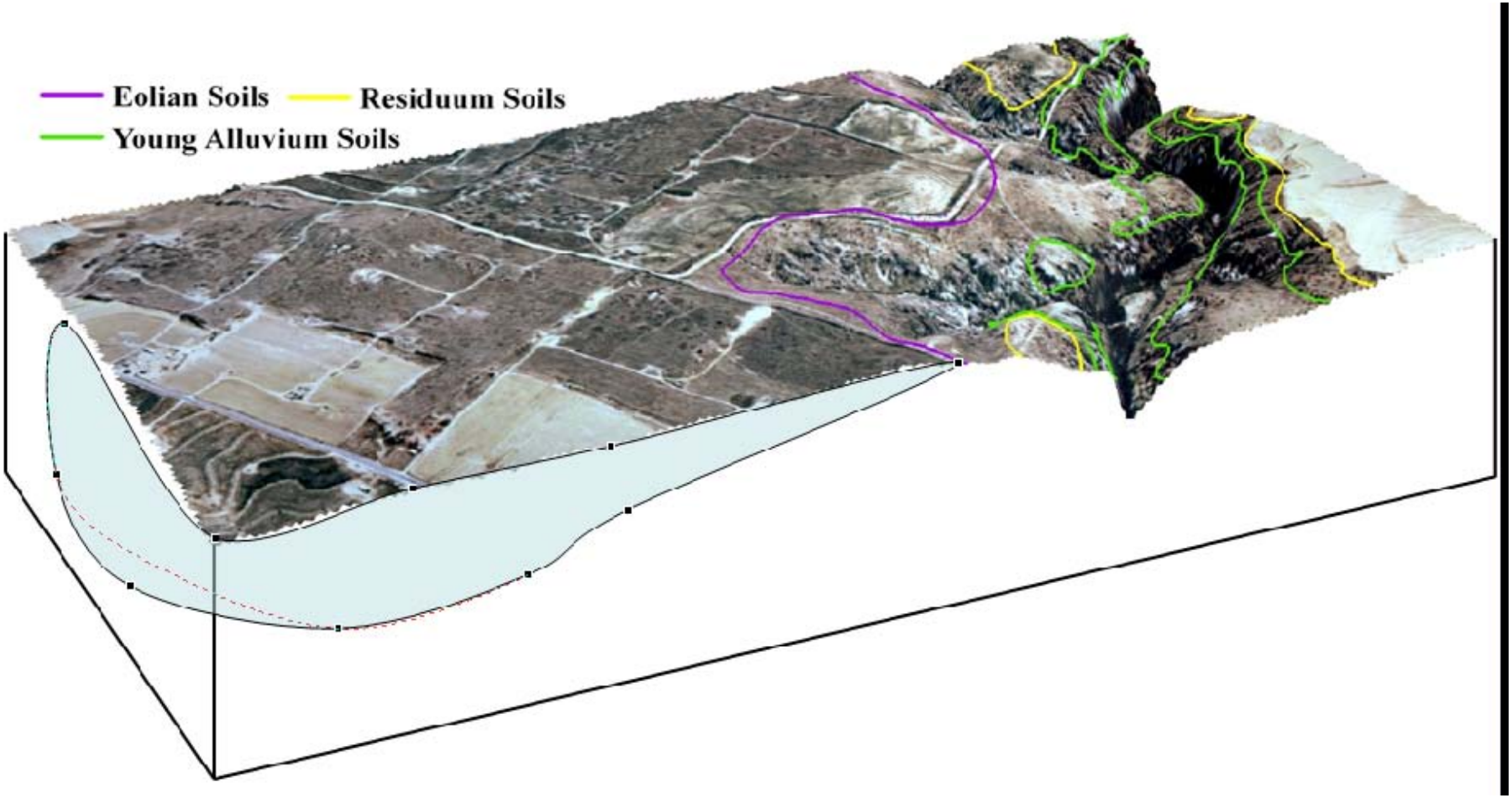

Fig. 12. Drawing of curved line on block diagram with 50% fill transparency and vertices showing.

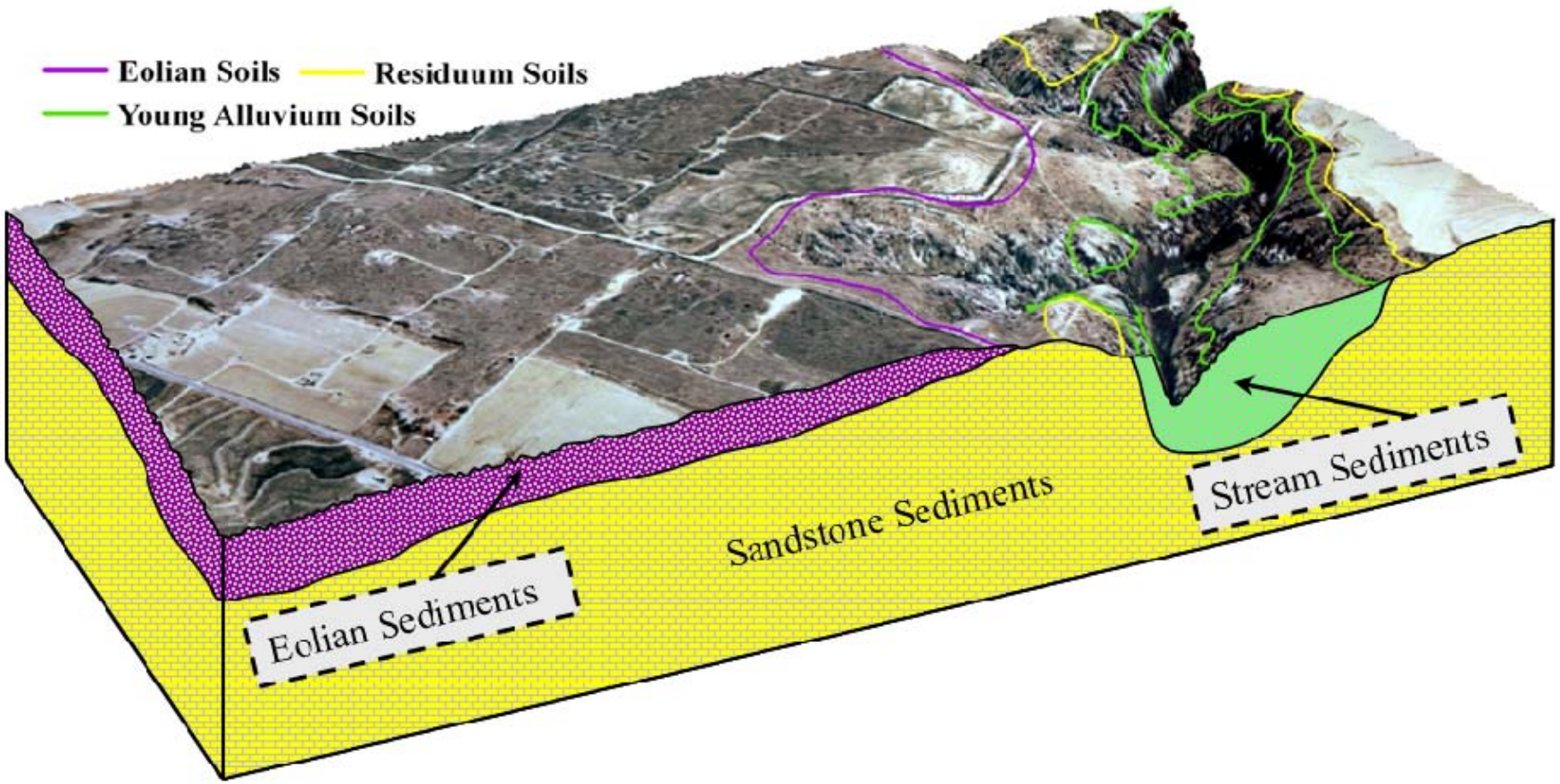

Fig. 13. Areas illustrated with curved lines and filled, labled with text boxes and arrow callouts.