



Advanced HGIS

(last updated October 2005)

INTRODUCTION

Some of the advanced features in Handheld Geographic Information System (HGIS) by StarPal™ are worth exploring as they make fertilizer management, contouring of data, and boundary modification productive for producers. We will explore these features in more detail.

EXTRACTING AN IMAGE

Why is this useful? This is one method of breaking a field into management zones for collecting soil samples and spreading fertilizer in a variable rate method. By grouping the soils together based on soil color, one creates management zones of similar soil properties.

From the HGIS manual: “Extract Image will create a new point layer and color each point with the image color at that location. Attributes RED, GREEN, BLUE, and GRAY will be filled with the image values. This is normally done before contouring an image into zones. This may be a very slow process depending upon the size of the image. If the image is large, the program will ask if you want to reduce the number of points created by up to 75%. This is recommended for large images. Usually 40,000 – 100,000 points are best for creating contours.”

In order to speed up the process, complete this procedure on a desktop/laptop rather than the Pocket PC. Otherwise, the Pocket PC will be unusable for a long time, or not able to complete the process.

CONTOURING OF DATA

This function works with point data such as yield, conductivity, soil sample results, or in this case, the points extracted from the image. In HGIS, contouring is done in “equal ranges.”

BOUNDARY MODIFICATION

At times, it is useful to be able to modify a field boundary using HGIS to get accurate results in the field when splitting field boundaries. An example of this would be splitting out a certain number of acres within a field to plant to another variety or another crop. HGIS makes this task much easier.

EXERCISES

Exercise 1 – Extracting an image

- You must have field boundaries (drawn or GPS-collected) before beginning this, as well as an aerial or satellite image.
- Open _____ .jpg as your image file and _____ .shp as the boundary file for the field.
- Use the drop down menu and choose Select Tool, then click on the boundary.
- Choose Adv|Advanced Spatial|Extract Image and select the _____ .jpg as the image.
- You can choose a buffer and buffer size for the extraction. This depends on your preferences. For this exercise, choose no buffer.
- You now select the number of points to be extracted. If this operation is to be completed on a Pocket PC, then it's wise to choose the lowest number. Choose 100% if on a desktop machine. After it completes processing the extraction you will see a new point layer (ImagePoints_001.mif).



Exercise 2 – Creating a contour layer...management zones from soil color

- Choose Adv|Advanced Spatial|New Contour Layer.
- Select the ImagePoints_001.mif as the point layer to create the contour layer (file created from doing the extract image exercise).
- Change the theme layer to GRAY and accept the defaulted check boxes and press the THEME button.
- Choose four for the number of zones in the field for this exercise.
- You now have a separate contour layer (Contour_001.mif) that has separated the field into four zones of like soil color. It is now possible to take composite soil samples in each zone and manage each in a variable-rate manner.

Exercise 3 – Populating management zones with soil sample locations

- How do I sample the new management zones? This has been solved by selecting Map|Misc. Functions|New Target Layer, then selecting the Contour_001.mif created in the previous exercise.
- You then specify the number of targets (or sample locations) for all four zones. You can accept the default or enter in a different number. Enter in 40 for this exercise.
- Once the amount of samples to create in the layer is selected, choose to review each zone or just allow HGIS to enter in the amount for each layer. Choose to Review Each Zone.
- You now are able to specify the number of samples per zone. Continue through each zone either accepting or modifying the number of samples.
- Now the new layer (Zones_001.grd) is useful for navigating to soil sample locations.

Exercise 4 – Modifying field boundaries

- It is often necessary to modify/split a field boundary to a certain number of acres to plant a different variety/crop. HGIS makes this possible to create the boundary and navigate the boundary for flag placement to delineate the boundary.
- Open the _____ .shp file.
- Use the draw tool and create a line that begins outside the boundary and ends outside the boundary on the opposite side. It can be N-S, E-W or diagonal.
- Use the select tool and click the line tool.
- Click on Adv|Combine Objects|Save Outline.
- Using the select tool click in the boundary of the field.
- Click on Adv|Combine Objects|Split By Outline.
- Select the method of splitting you want to complete. For this exercise, select split parallel and enter in 10 and then change the % to acres.
- Refer to the HGIS handbook for more advanced uses of this tool.