

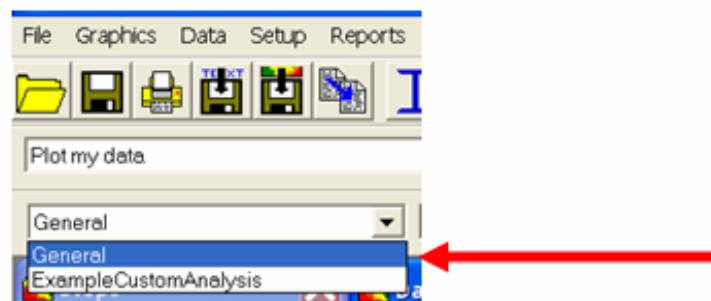
Chapter 16: Creating Ratio/Sum of Fraction Maps Using Custom Criteria (Custom Analysis)

In the last chapter, we saw how to screen raw data values against custom screening values imported in through either Excel (.csv) or Access(.mdb). This chapter assumes you know how to import custom criteria.

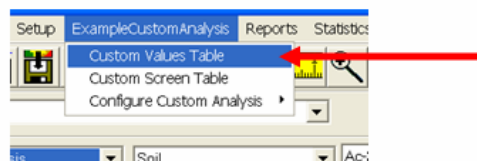
Producing a Ratio Map

Let's begin by opening the file UsingCustomCriteria.sda. This is a two dimensional soil data set with analytes Ac-225, Anthracene, Arsenic, and Barium. A set of custom criteria values was created (See earlier chapter) and imported into SADA. The file containing these custom criteria was called ExampleCustomAnalysis. Let's take a look at those custom criteria first.

In the analysis drop down box, select ExampleCustomAnalysis. SADA assumes the name of your file as the custom analysis type, so make sure to choose an appropriate name for your file.

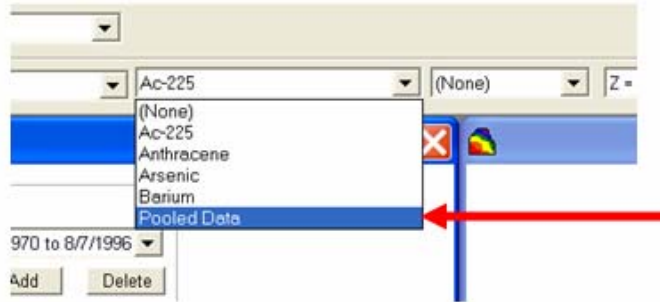


When you select ExampleCustomAnalysis, an extra menu item appears with the same name. Select this menu item and then select the submenu CustomValues Table.



The custom values table appears where you can see and edit your custom values. Recall that any changes to the custom values inside of SADA will not affect the original source file or database.

Notice that you can only see custom values for Ac-225. This is because you currently have Ac-225 selected. Close the custom values table window and selected Pooled Data from your data set drop down.



You'll notice that the sample points turn black and the interface may adjust slightly. This is normal. Each sample point represents a location where at least one analyte was measured. Since each location may have more than one analyte, SADA does not know which values to plot and so leaves the points blank. See Chapter 11 for more information on pooled data. For our purposes here, pooling the data allows the custom analysis table to show you all the custom criteria for soil at once.

Now return and select the ExampleCustomAnalysis menu and then the Custom Values. This time you should see all the custom criteria for each of the four soil contaminants. Pooled operations like these are done by data type (media type). If we had groundwater data in this file, you would have to see the pooled results for soil and groundwater separately.

The screenshot shows a window titled "Viewing ExampleCustomAnalysis values." with a toolbar containing icons for Print, Copy, Save to disk, Autodocumentation, and Export to Excel. Below the toolbar is a table with the following data:

Analyte	casnum	Regional Level	State Level	Background
Anthracene	120127	0.0316	0.548	
Ac-225	14265851	3	3.5	2.4
Arsenic	7440382	12.1	57	12
Barium	7440393	80	90	25

This window also provides some important features in the toolbar. Moving from left to right, we have

Print: prints the table out.

Copy: copies the contents of the table to the clipboard where they can be copied to an outside software product such as word or excel.

Save to disk: saves the table results to a comma delimited text file that can be opened elsewhere.

Autodocumentation: records the contents of the table to the currently opened autodocumentation report.

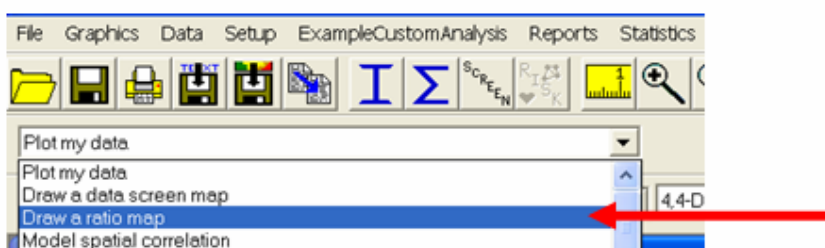
Export to Excel: possibly the most useful output format where SADA opens Excel up and exports automatically to the first spreadsheet.

Close this window out. Now let's create a ratio map using your custom criteria.

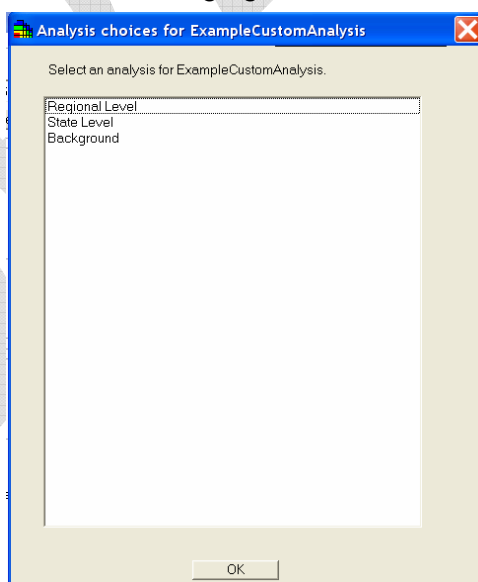
Importing Custom Screening and Remediation Criteria (Custom Analysis)

Spatial data screens quickly identify the spatial distribution of data points that are in excess. The approach is quite simple as points are marked as either exceeding or not. Ratio maps extend this by showing the severity of the exceedance. SADA simply divides each individual point by the decision criteria and plots the resulting ratio value. If the ratio exceeds a value of one, this indicates that the concentration must be larger than the custom criteria. A ratio of 25 indicates that the concentration is 25 times higher than the decision criteria. A ratio of 1.05 indicates that the concentration is only 5% higher than the decision criteria and a ratio of .50 indicates that the concentration is only half the decision criteria. A simple screening against the data values would not reveal the relationship between point values and custom criteria.

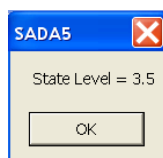
Let's try creating a ratio map now. In particular, let's examine the Ac-225 data. We know from the tabular screen this is a contaminant of concern when compared to the regional screening level. Make sure you still have ExampleCustomAnalysis selected in the analysis type box. Then in the interview box, select Draw a ratio map.



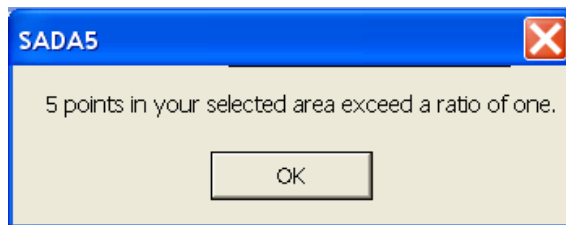
Press the button Show Me The Results at the bottom of the steps window. You will be presented with custom choices for screening against.



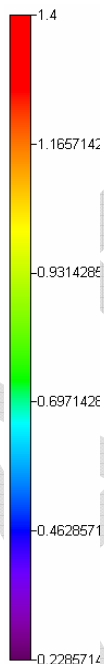
Select State Level and press OK. SADA reports that your custom value for State level is 3.5.



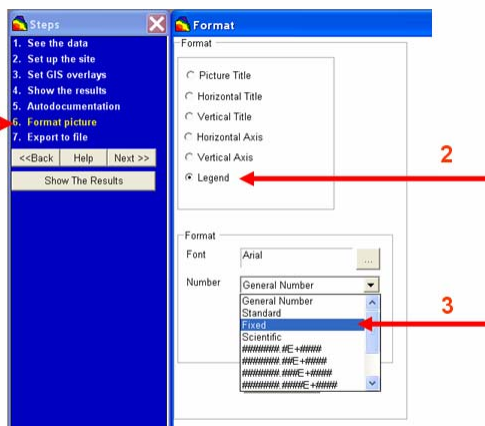
Press OK. The next window reports that 5 individual points exceed this criteria (ratio > 1)



The graphics viewer is then updated. The legend now refers to ratio values instead of concentration values.



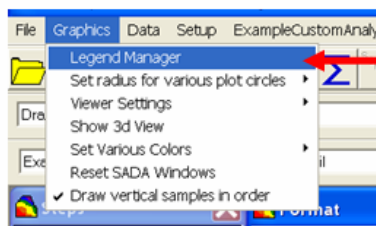
Notice that the number formatting on this legend has a lot of digits to the right of the decimal. Let's clean this up. On your steps form, select Format Picture. In the parameter window, select Legend and in the number format select "fixed". This will limit the number of decimals to 2.



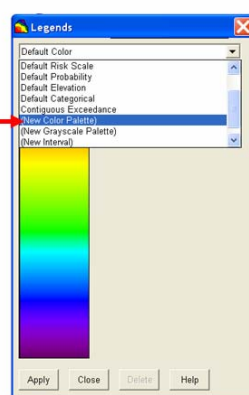
Importing Custom Screening and Remediation Criteria (Custom Analysis)

Press Apply and notice that your legend changed accordingly. This change will remain in place for this legend for all ratio maps from now on. If you change your legend or create a new one, you will need to re-specify the number format again.

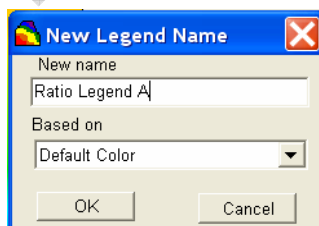
As you look at the map, it may be somewhat difficult to determine the locations that are more severe than others. You can create a new legend that emphasizes those that are among the greatest exceedances. From the main menu select Graphics→Legend Manager



This brings up the legend manager window. Select from the list of legend options (new color palette)

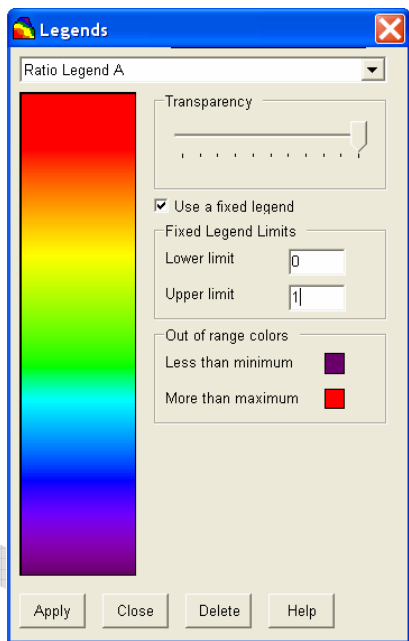


You will be asked for some information on your new legend. Give the new legend the name "Ratio Legend A" and based the legend on the already available "default color" legend.

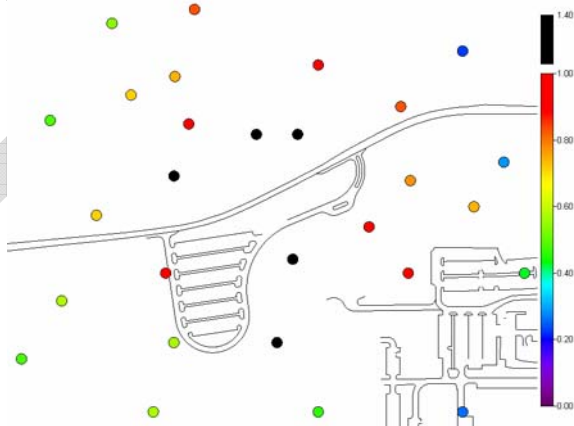


When you base a legend on an existing legend, SADA makes a copy of the base legend as a starting point for you. You can then customize the legend as you wish. Note that you cannot customize default legends. You will first need to create your own legend just as we now did. Press the OK button.

SADA selects your newly created legend in the options box. Notice that there are now methods for customizing the legend. For ratio maps, it might be a good idea to highlight exceedance with a unique color. To do this, check the option “use a fixed legend”. Below this checkbox item, enter a value of zero for the lower limit and a value of 1 for the upper limit. The color band will now stretch between these two values. Below these upper and lower limit boxes are two “out of range” colors. These colors will be used to highlight values that are not between 0 and 1 (or whatever values you choose for the lower and upper limits). We will change this next but first, make sure you legend manager window looks like this.



Mouse click on the red box and change the color to be black and press OK on the color palette window. Press the Apply button and notice how easily those that exceed a given criteria now stand out.

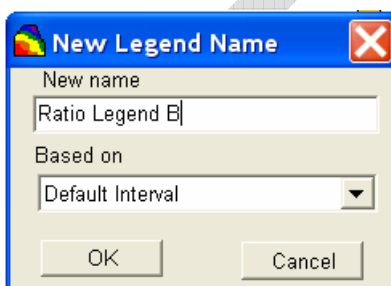


Importing Custom Screening and Remediation Criteria (Custom Analysis)

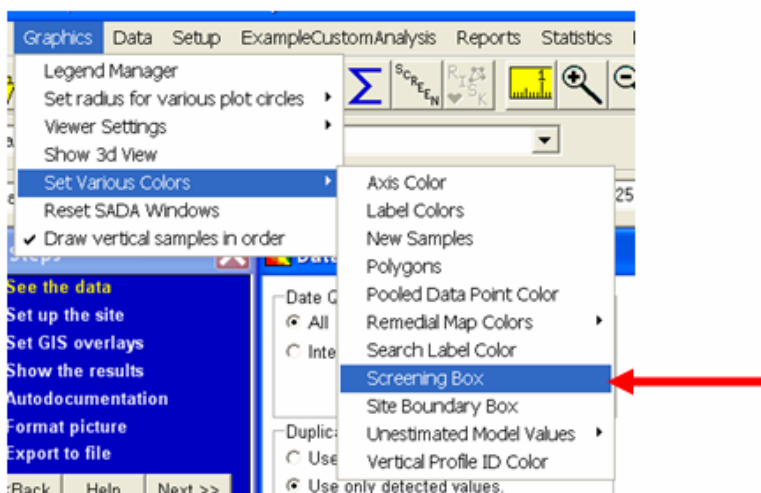
For fixed legends, SADA creates a break between the color band on the color used for all values above or below. If no values in your data set exist outside the range of your color band, then the legend segment will not be shown. For example, in the picture above, no ratio values were less than zero so. Therefore, no legend fragment was created below the color band.

This picture still does not necessarily show the severity with which points exceed the criteria very well still. Let's return to the legend manager and create a new type of legend that will. First though, save your SADA file as UsingCustomCriteria_modified.sda.

From the main menu, select Graphics→Legend Manager again. In the dropdown box select "New Interval". In the new legend window, name your new legend "Ratio Legend B" and base it on Default Interval. If your new legend name window looks like this press Ok to close the window.



The default color for these boxes is black. However, against dark back grounds especially photographs, it may be difficult to see the boxes. To change the color of the exceedance boxes, choose from the main Graphics menu → Set Various Colors→Screening Box.



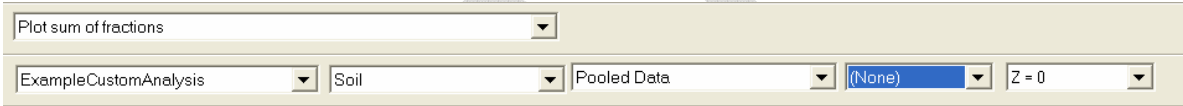
You can select a different color for the boxes and press Ok.

Currently, the data screen map cannot be shown in the 3d viewer. To see a data screen map for 3d data in a true 3d environment, you can manipulate the legend manager to essentially perform the same screen using colors for a particular decision value. In the chapter on quick screenings you will find an explanation on how to do this.

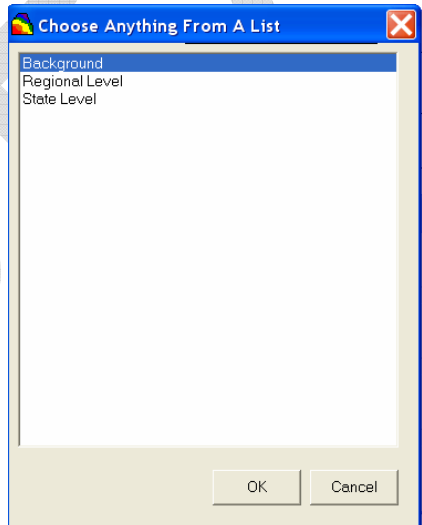
Creating a Sum of Fractions Point Map

In a sum of fractions map, a ration map for each contaminant in the pooled data list is first created behind the scenes. These maps are then summed together to create a sum of fractions map. This type of map indicates how individual contaminants may be acting together collectively with respect to a sum ratio of one. So if a point on the map exhibits a sum of fractions value of 2 then collectively the contaminants may be causing concern when considered together. This type of map is more typical in radiological assessments.

If you have already closed the file UsingCustomCriteria.sda, then reopen it now. Select ExampleCustomAnalysis from the analysis drop down box, soil from the data type box, and Pooled in the data set box. In the interview box select Plot Sum of Fractions. Make you're your SADA selections look like the following.



Now in the steps window press the Show The Results button and you are presented with custom criteria options.



Select background and press OK. SADA responds that not all of your contaminants have a background value. You can either continue with the analysis or not. If you continue, SADA will create a sum of fractions map excluding those contaminants with no background criteria. Select Yes. SADA reports that a total of 30 samples exceed a sum of fractions equal to one and highlights them with exceedance boxes.

Now you try. Repeat the above steps for Regional and State Level.

Re-enforcement

Let's place a copy of this data screen map into a powerpoint presentation. From the main toolbar select the copy button.



Open Microsoft Powerpoint and create a new blank presentation. In Powerpoint, select Edit → Paste.