

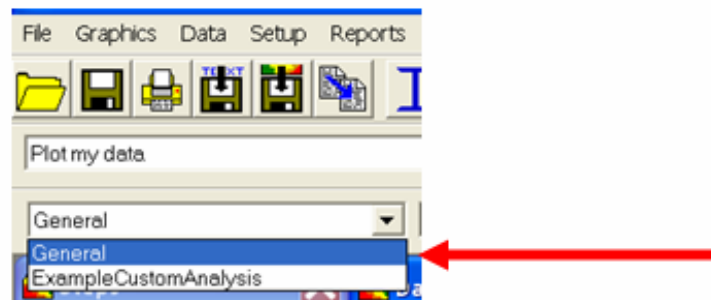
Chapter 15: Screening Data Against Custom Criteria (Custom Analysis)

In the last chapter, we saw how to create and import custom screening criteria by importing it as a .csv (Excel). You can also create a Microsoft Access Database that contains your custom criteria and SADA can import that as well. In this chapter we will focus on how to screen your data against these custom criteria. This chapter assumes you know how to import custom criteria.

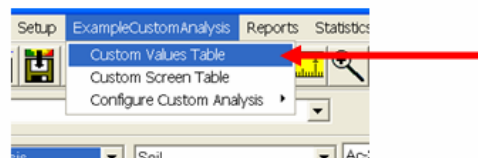
Producing a Tabular Screen

There are two ways to screen data against custom criteria: tabular and spatially. 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 previous 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.

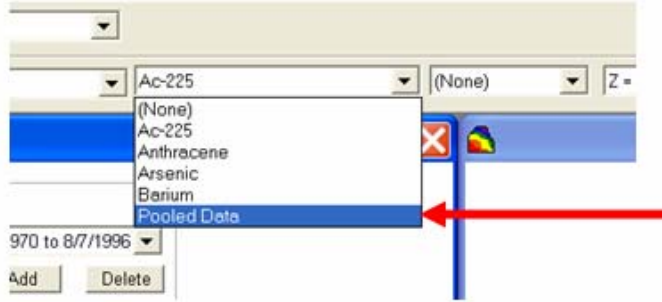


When you select ExampleCustomAnalysis, an extra menu item appears with the same name. Select this menu item and then select the submenu CustomValues Table.



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 and a table. The table has 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.

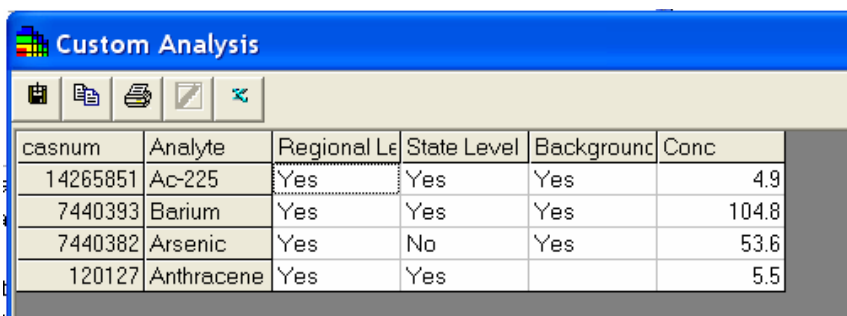
Save to disk: saves the table results to a comma delimited text file that can be opened elsewhere.

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.

Importing Custom Screening and Remediation Criteria (Custom Analysis)

Close this window out. Now let's perform a tabular screen of your data against your custom criteria. Select from the main menu once again ExampleCustomAnalysis but then select Custom Screen Table. You will see a very similar window appear as follows.



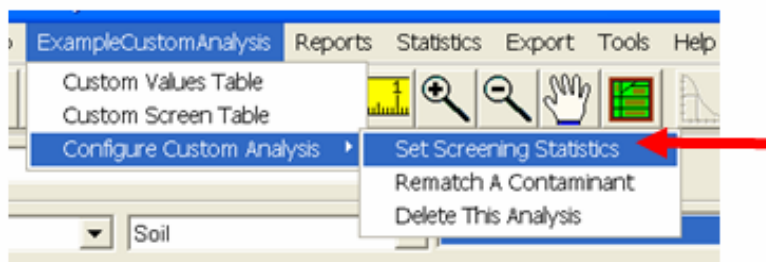
casnum	Analyte	Regional Le	State Level	Background	Conc
14265851	Ac-225	Yes	Yes	Yes	4.9
7440393	Barium	Yes	Yes	Yes	104.8
7440382	Arsenic	Yes	No	Yes	53.6
120127	Anthracene	Yes	Yes		5.5

Let's take a moment to discuss how one should interpret this table. Each row contains an analyte. The first two columns show the Analyte name and CAS number (if available). The next three columns are the three custom criteria field names you assigned to your screening criteria: Regional Level, State Level, and Background Level. The fourth column shows the *representative concentration* and we'll discuss this shortly.

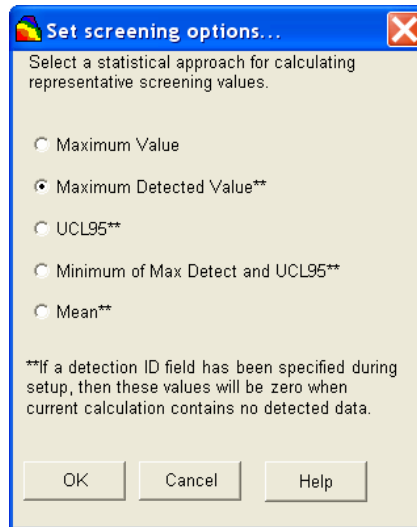
In each cell, a Yes in any cell indicates that the screening criteria for that custom field and for the analyte in the row was exceeded. For example, the data for Ac-225 exceed the criteria for the Regional level. A value of No means that the criteria was not exceeded. A blank value means that no custom criteria was available in your file. In otherwords, there is no criteria for Anthracene in the background.

When SADA screens your data against a criteria, it must first determine what value it will use. You likely have many data points and certainly have only one criteria value for any given field (e.g. Regional). SADA must select or calculate a representative value (in environmental lingo its called the representative concentration) to compare to the criteria. In the Ac-225/Regional cell above, SADA used a value of 4.9 for the representative value for Ac-225. In this case, 4.9 was the maximum detected value in the data set. You can control the value SADA selects.

Close the window and select from the main menu ExampleCustomAnalysis then Configure Custom Analysis and finally Set Screening Statistics.



A window appears with some common selections for determining the representative concentration.



There are five options:

Maximum Value

The maximum concentration, detected or nondetected, for normal or lognormal distribution

Maximum Detected Value

The maximum detected concentration for normal or lognormal distribution

UCL95

The 95% upper confidence limit on the mean for normal or lognormal distribution

Minimum of Max Detect and UCL95

The minimum of the two calculations (see above)

Mean

The average concentration over all values for normal or lognormal distribution

Note that a common selection is to use the maximum detected value for environmental assessments. This is the default selection. Try selecting the mean instead and then return to the screening table. You will notice that the concentration field has changed and as well as the screening results (Yes/No).

The screening window has the same toolbar features as the custom viewing table had. Using these toolbar buttons you can export to excel, print, save to file, and add to autodocumentation. Tabular screens are useful in highlighting contaminants of concern (to determine “the who”) However, they do not inform about the location or spatial distribution of any data points that may be exceeding the criteria. For this type of assessment, we will need

to identify those contaminants of concern from the screening table and then individually apply spatial screens (to determine “the where”).

Spatial Data Screens

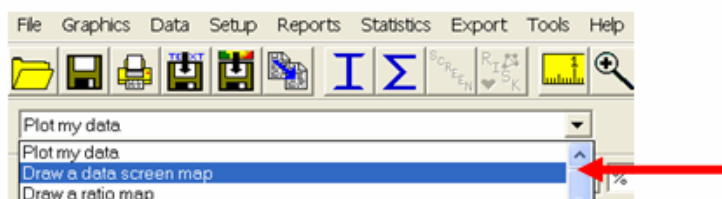
Tabular screens are very useful in quickly identifying which contaminants are exceeding a screening criteria. Spatial data screens quickly identify the spatial distribution of data points that are in excess. The approach is quite simple. SADA simply compares each individual point to the decision criteria and if it fails, the point is graphically enclosed in a box.

It is important to point out that there can be some disconnectivity between tabular and spatial screens. In a tabular screen, we are comparing the screening criteria to a singular representative concentration that you can control when configuring your screen. This representative concentration has no meaning in a spatial data screen where each point is individually compared to the decision criteria.

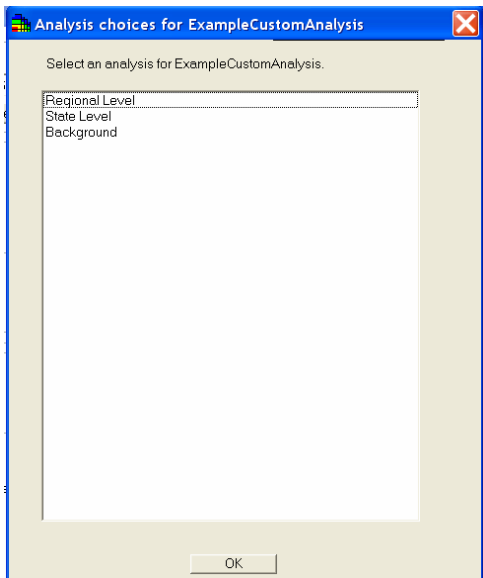
Suppose that the tabular screen representative concentration is set to the maximum value. In that case, one would expect that at least one data point in a spatial screen would be identified as an exceedance. However other selections may not yield these results. For example, consider the UCL95. For small data sets, the UCL95 might be much greater than the largest measured value. In this case, you might see a YES in the tabular screen, but a spatial data screen shows no exceedances. This is actually correct. The converse may also be observed. Suppose we the representative concentration is set to be the minimum of the maximum detect and the UCL95. Furthermore suppose that the UCL95 is the smaller of the pair. It is possible that the UCL95 does not exceed the criteria but the maximum detected value does. In this case, at least one point in the spatial screen would be identified as exceedance (at a minimum the maximum detected value itself).

In many cases, these differences are not problematic as tabular screens are typically used simply to identify the contaminants of concern. Spatial data screens are then applied to these contaminants of concern and any discrepancies are simply noted.

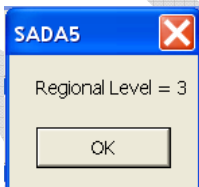
Let's try a spatial data screen using custom criteria. In particular, let's examine the Ac-225 data. We know from the tabular screen this is a contaminant of concern when compared to the regional screening level. Make sure you still have ExampleCustomAnalysis selected in the analysis type box. Then in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



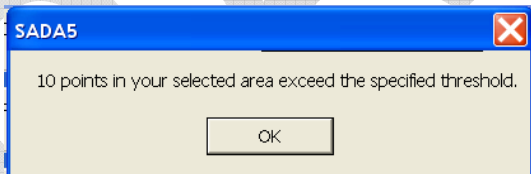
Press the button Show Me The Results at the bottom of the steps window. You will be presented with custom choices for screening against.



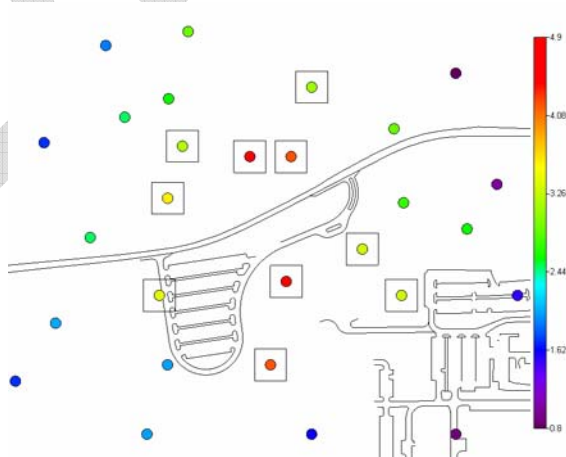
Select Regional Level and press OK. SADA reports that your custom value for Regional level is 3.



Press OK. The next window reports that 10 individual points exceed this criteria.

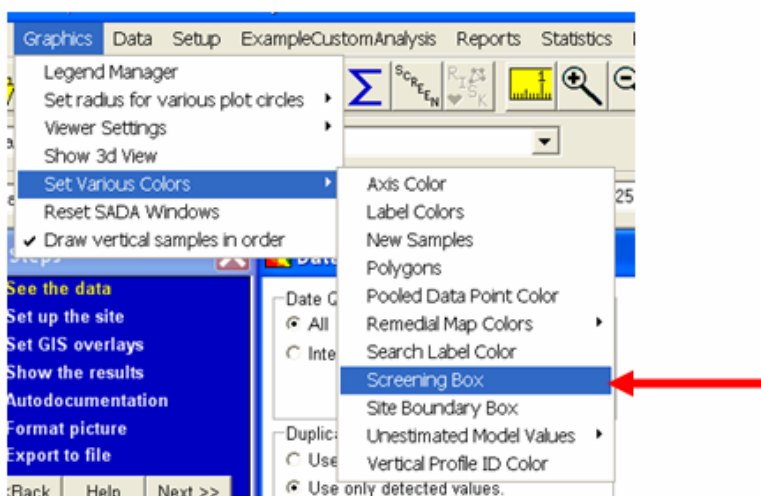


The graphics viewer is then updated. Wherever a data point exceeds the criteria, a box is placed around the sample point.



Importing Custom Screening and Remediation Criteria (Custom Analysis)

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.

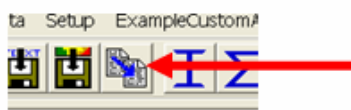


You can select a different color for the boxes and press Ok.

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.

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.