3 Spreadsheets

Overview

In this chapter the use of the data spreadsheet and generating alternative views of the data is described.

Opening Spreadsheet Data

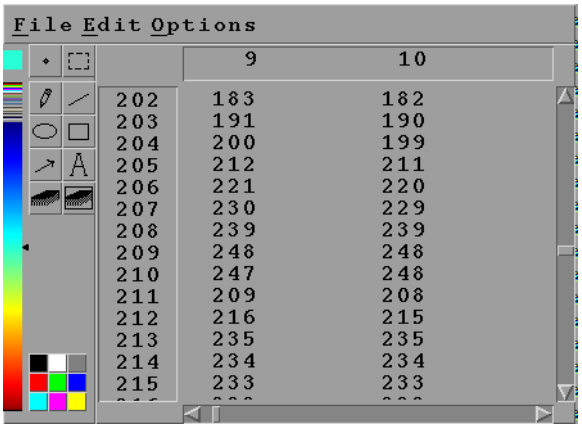
Spreadsheet data can be opened from an HDF file.

Opening Spreadsheet Data from an HDF File

To open spreadsheet data from an HDF file, select the Open option from the File menu in the NCSA Collage Main window. The File Selection window will be displayed. Locate the HDF file and double-click on file name. The HDF Browser will be displayed. Select the NDG (Numerical Data Group) from the buttons on the left of the HDF Browser window and the NDG data objects will be listed in the Tag Name area. Double-click on an NDG to open it in a Spreadsheet window.

If there are several NDG data objects that you would like to open, click and drag the cursor to highlight more than one data object. Select Send Selection from the Transport menu in the HDF Browser window. Each data object will be opened in its own window.

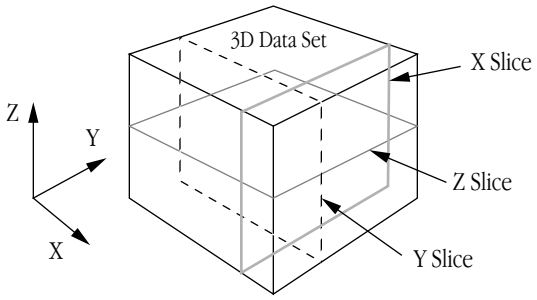
Figure 3.1 Spreadsheet Window



Opening a 2D Slice from 3D Data

3D data sets may also be loaded from HDF files. Currently, NCSA Collage for the X Window System can load only a 2D slice of a 3D data set. The 2D slice can be of any orientation (X, Y, or Z) and increment within the 3D data set as shown in the following figure.

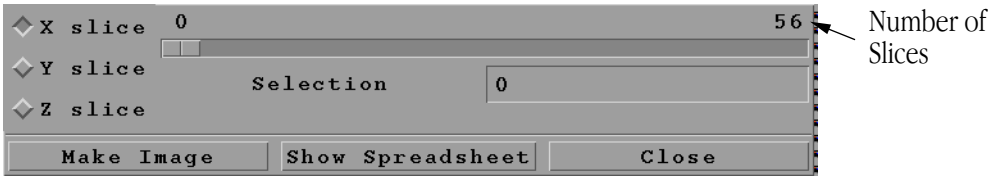
Figure 3.2 Slice Orientations



For example, choosing the X slice option allows you to select a Y-Z data array. Choosing the Z slice option, allows you to select an X-Y data array.

To open a 2D slice from a 3D data set, select the Open option from the File menu in the NCSA Collage Main window. The File Selection window will be displayed. Select the file by double-clicking on its name. The HDF Browser window will be displayed. Select the NDG button to display the NDG data objects in the Tag Name area. Double-click on a NDG 3D data set name. The Slice Selection window will be displayed.

Figure 3.3 Slice Selection Window



To select a 2D slice from the 3D data, choose one of the slice options at the left: X, Y, or Z. The number of slice layers is shown along a slider bar. You may select one slice by moving the slider right or left. To move the slider, click and drag on the control marker and move the mouse right or left. As you move the control, the current slice number will be displayed in the Selection field. Alternatively, you may enter a slice value by typing the value in the Selection field.

Once you have selected the slice value you want, click on the Show Spreadsheet button and the data will be loaded into a spreadsheet window.

Exercise 3.1 Load a Slice from a 3D Data Set

For this example, use the sample data file:

`/Samples/cloud57x57x57.hdf`

1. Select the Open option from the File menu in the NCSA Collage Main window. The File Selection window is displayed.
2. Select the data file **`cloud57x57x57.hdf`** by double-clicking on the name of the file. The HDF Browser window is displayed.
3. Select the NDG button to display the NDG data items in the Tag Name area. Select a data set by double-clicking on its name. The Slice Selection window is displayed.

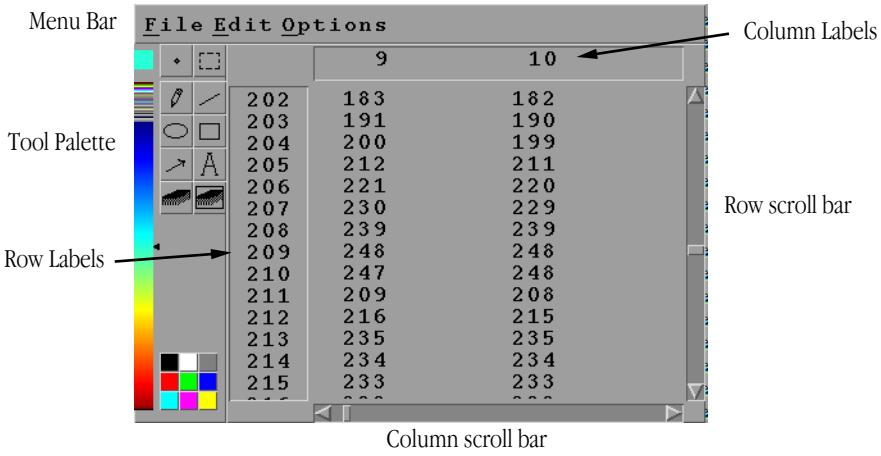
4. Choose the X Slice button and select a slice number. You can use the slide control or enter the slice number in the Selection field.
5. Click on Show Spreadsheet to display the slice in a spreadsheet window.

Spreadsheet Window

Spreadsheet data is displayed in a row-column format with rows and columns labeled numerically. Scroll bars are available to change the view of the data by dragging the slide control or clicking on the arrows.

The tool palette is displayed on the left of the Spreadsheet window. The use of the tools is described in Chapter 2, “Basic Procedures.”

Figure 3.4 Spreadsheet Window Components.



Spreadsheet Menus

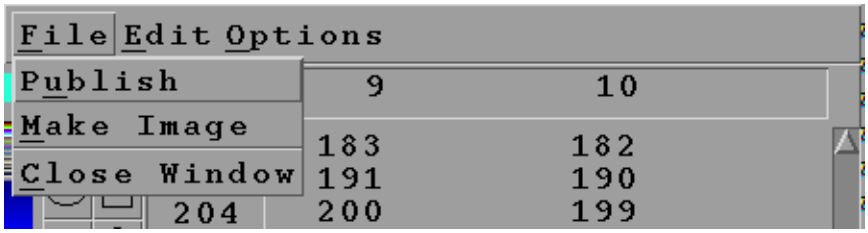
This section briefly describes the menus for the Spreadsheet window. Detailed descriptions are given in later sections.

File Menu

The File menu contains the following options:

- Publish, to publish data to a collaborative session so that other participants may view the data
- Make Image, to generate a raster image from the spreadsheet data
- Close Window, to hide the spreadsheet window from view

Figure 3.5 Spreadsheet File Menu

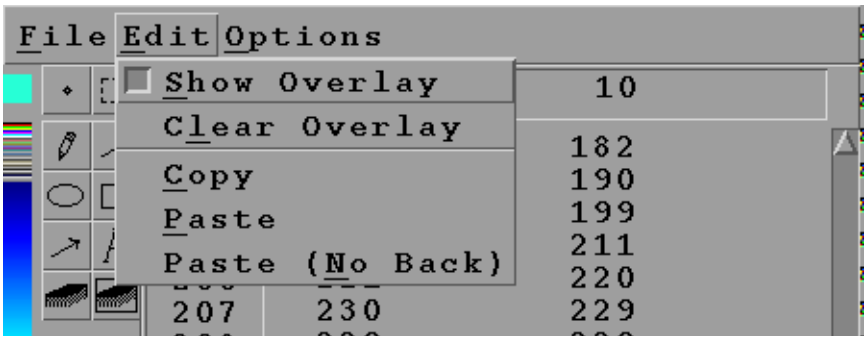


Edit Menu

The Edit menu has the following options:

- Show Overlay, to display the overlay layer and its annotations
- Clear Overlay, to erase all annotations from the overlay
- Copy, a screen capture tool that copies any portion of the screen image to a cut buffer
- Paste, to paste the image captured by Copy into the current NCSA Collage image
- Paste (No Back), same as Paste, but without the background of the X window

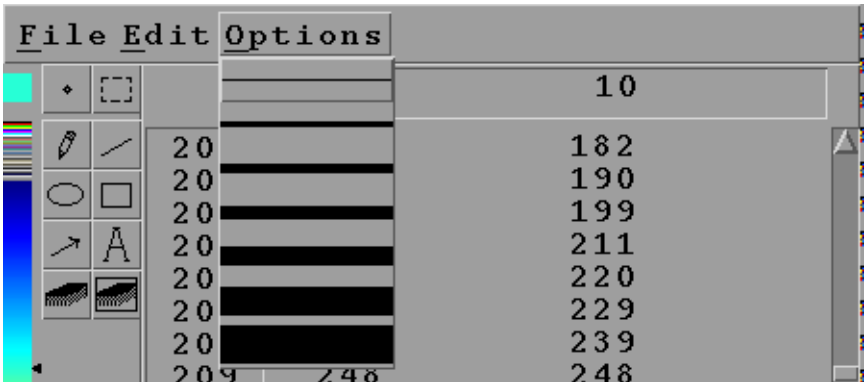
Figure 3.6 Spreadsheet Edit Menu



Option Menu

The Options menu allows you to change the line thickness for the drawing tools.

Figure 3.7 Spreadsheet Options Menu

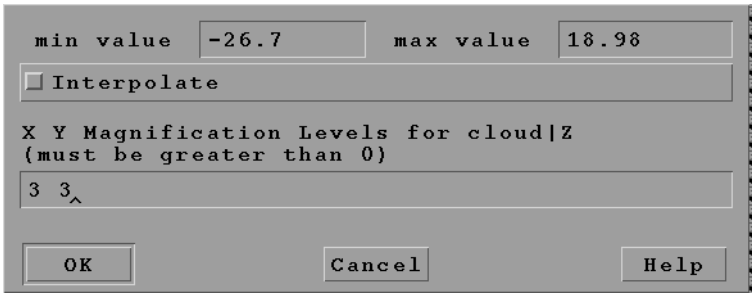


Generating an Image From a Spreadsheet

Raster images can be easily generated from a spreadsheet.The floating-point data is scaled to a displayable range of values in the current color table. You also have the option of magnifying and interpolating the data before it is displayed.

To generate a raster image from a spreadsheet, select the Make Image option from the File menu in the Spreadsheet window. The Magnify window is displayed.

Figure 3.8 Magnify Window



Magnification Factor

You can enter the X and Y magnification factors for the image. Depending on the screen display of your system, you will need to magnify images that have about 100 data points or less along one axis. The higher the resolution of your screen, the smaller the image will be when generated. You may need to experiment with different magnification values to see what works well for your system.

Interpolated Images

Interpolated images are much like generated images, except that at higher magnifications they appear smoother. A generated image has a very grainy appearance when the dimensions of the image exceed the dimensions of the dataset from which it was computed. If the image is the same size as the floating-point dataset, generating images and interpolating images often produce very similar results. To compute an interpolated image, select Interpolate from the Magnify window.

Exercise 3.2 Generating an image from a scientific dataset

1. Select the Spreadsheet window for the dataset we loaded previously.
2. Select the Make Image option from the File menu. The Magnify window is displayed.
3. In the Magnify window, enter a magnification factor. Click on the X Y Magnification Level field and enter a 3 followed by a space followed by another 3.
4. Select the Interpolation button.
5. Click OK. The image is computed to the size specified and displayed in an Image window.

Data Analysis

Two data analysis tools are available in the tool palette:

- Point Selection tool to examine the value of a single point of data
- Area Selection to generate a histogram plot

Selecting Points in the Spreadsheet

To select an individual cell in a spreadsheet, select the Point Selection tool and click on the cell you wish to select. If an associated raster image has been generated from the spreadsheet (or a spreadsheet has been generated from a raster image), then the selection will also be highlighted in the raster image.

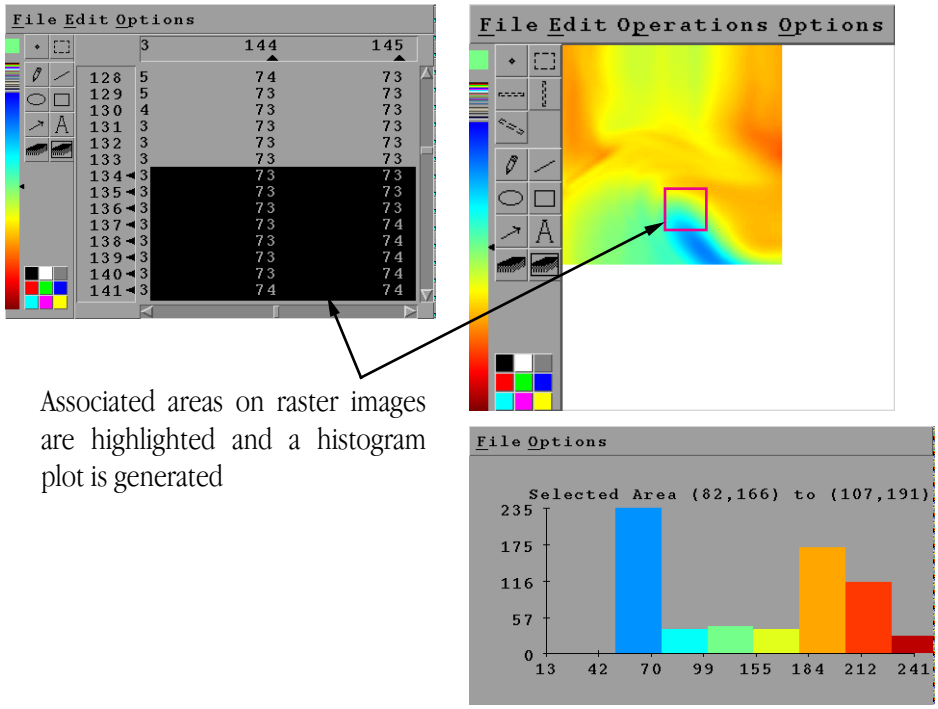
Selecting Areas in the Spreadsheet

To select an area in a spreadsheet, select the Area Selection tool. In the data display of the spreadsheet, click and drag the mouse from the upper left hand corner to lower right hand corner to highlight an area. If an associated raster image has been generated from the spreadsheet (or a spreadsheet has been generated from a raster image), then the selection will also be highlighted in the raster image. Once an area is selected, a histogram plot of the data will be generated.

Exercise 3.3 Selection of a spreadsheet and associated images

1. Select the Spreadsheet window.
2. Select the Area Selection tool. Click near the upper left hand corner of the spreadsheet.
3. With the mouse button still depressed, drag the cursor down and to the right.
4. Release the mouse button. The corresponding area of the image that was generated will also be selected and shown in a rectangle. A histogram plot will also be generated displaying the distribution of values in the area selected.

Figure 3.9 Selecting an area in a Spreadsheet



Associated areas on raster images are highlighted and a histogram plot is generated

Selecting Areas of the Spreadsheet using the Raster Image

Since large data sets can be difficult to view using the spreadsheet window, you may find it easier to view the generated raster image of the data. When you want to examine an area to see the kind of values it contains, you can select an area on the raster image and the associated area will be highlighted on the spreadsheet.

Spreadsheet Annotation

All the drawing tools are available for annotating the spreadsheet. All drawings are made on the overlay layer and do not affect the data. The drawing tools are described in section *Using Annotation Tools and Overlays* in Chapter 2, “Basic Procedures.”

Manipulating Spreadsheet Data

This feature is not yet implemented.

Saving the Spreadsheet and Overlay

This feature is not yet implemented.

Printing the Spreadsheet and Overlay

This feature is not yet implemented.