CHAPTER 4

Utilities

With HEC-DSSVue, you can rename, delete, duplicate, and copy data in HEC-DSS files. You can also compare data sets and whole files to determine differences as well as search for values within files.

Other utilities include verifying the database integrity, "squeezing" a database to remove unused space, and rebuild tables to make access more efficient.

HEC-DSSVue supports Jython (a Python derivative for Java) scripting to aid in performing repeated tasks and accessing programming level operations.

4.1   Renaming HEC-DSS Data in HEC-DSSVue

The **Rename Records** command opens a pathname editor, which allows you to change the common pathname parts of the selected records. To rename HEC-DSS records:

1. Select the record or records to rename.
2. From the **Edit** menu, select **Rename Records**.   The **Rename Records to:** dialog will open, see Figure 4.1.
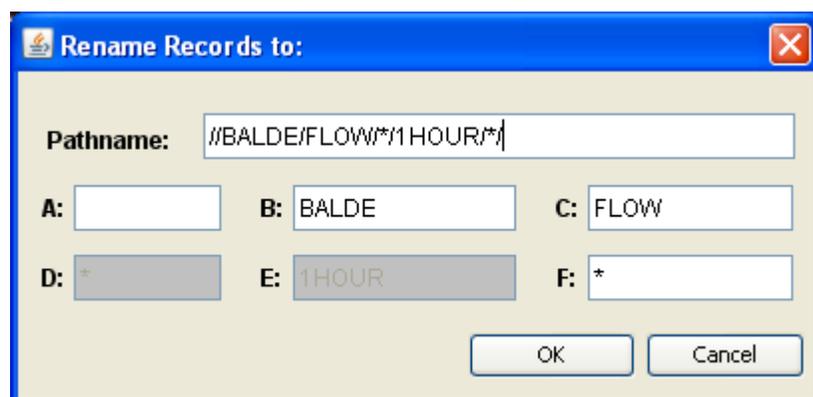

Figure 4.1 Rename Records to: Dialog Box

3. You may change one or more pathname parts or the entire record. Type the new **Pathname Parts** into the **A:**, **B:**, **C:**, **D:**, **E:**, and **F:** boxes. *Note: You cannot change the **D** or **E** parts for time series data (use Math Functions to accomplish this).*

4. For multiple records, pathname parts that are the same for all records will show up in the dialog. Where parts differ (such as having pathnames with C parts of FLOW and ELEVATION), the part will be displayed with an asterisk (**∗**).
5. When you are finished changing the pathnames, click **OK** to close the **Rename Records to:** dialog and save your changes.

4.2   Deleting Records

When you delete data from a HEC-DSS file, the data is marked as missing but it is not actually removed from the file until you run a **Squeeze** of the file. You can recover deleted records with the **Undelete** command described in the next section. Once a file has been squeezed, records cannot be undeleted. To delete records from a HEC-DSS file:

1. Select the record or records to delete.
2. From the **Edit** menu, select **Delete Records**. A dialog box will confirm that you want to delete those records. If the number of data sets is four or less, their pathnames will be displayed in the dialog.
3. Click **OK**. A confirmation message will appear, stating that the records have been deleted.

4.3   Undoing Deletions

Deleted records may be recovered as long as the HEC-DSS file has not been squeezed. When a file is squeezed, all deleted records are physically removed.

You can undelete records in three ways: undelete all records in the file, select the records to undelete from a list, or undelete the records that you just deleted.

To undelete records from a HEC-DSS file:

1. From the **Edit** menu, point to **Undelete**.
2. To undelete all records click **All**. A dialog box will appear to confirm that you want to undelete all of the records in the file. Click **OK**. A confirmation message will appear that states the records have been undeleted.
3. To undelete the records that you have just deleted click**Last Deleted**. A dialog box will confirm that you want to undelete the records that you just deleted. Click **OK**. A confirmation message will appear that states the records have been undeleted.

4. If you click **Select**, a list of the previously deleted pathnames will open, as shown in Figure 4.2.
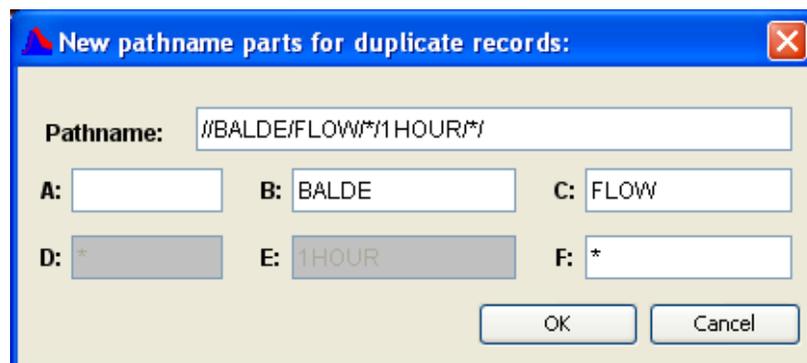

Figure 4.2 Undelete Records Dialog Box

5. Check the boxes next to the records that you want to undelete, or click **Select All** to undelete all records in the list. You can unselect the checked records by clicking **Unselect All**. Once you have made your selection, click **OK** to undelete those records and close the dialog. Alternatively, you can click **Apply** to undelete the records and leave the dialog box open. A confirmation message will appear stating that the records have been undeleted.

4.4   Duplicating Records

The **Duplicate** command duplicates records in the same HEC-DSS file, giving the new records different pathnames. To duplicate records:

1. Select the record or records to duplicate.
2. From the **Edit** menu, click Duplicate Records. The **New pathname parts for duplicate 5ecords** dialog box will open, Figure 4.3.
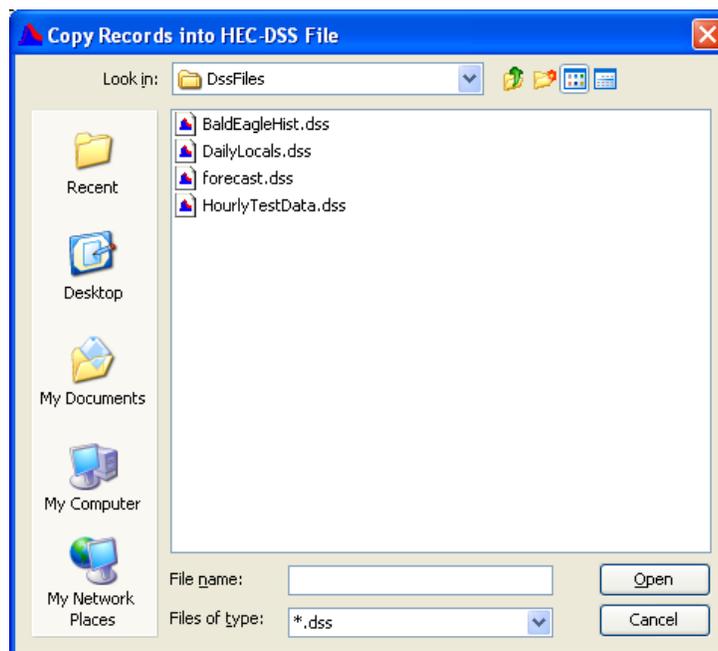

Figure 4.3 New pathname parts for duplicate records: Dialog Box

3. Type the new **Pathname Parts** into the **A:**, **B:**, **C:**, **D:**, **E:**, and **F:** boxes. You cannot change the D or E parts for time series data (use Math Functions to accomplish this).
4. For multiple records, pathname parts that are the same for all records will show up in the dialog. Where parts differ (such as having pathnames with C parts of FLOW and ELEVATION), the part will be displayed with an asterisk (*).
5. When you are finished changing the pathnames, click **OK** to close the **New Pathname Parts for Duplicate Records** dialog and save your changes. A confirmation message will appear stating that the records have been duplicated.

4.5   Copying Records into Another HEC-DSS File

To copy records into another HEC-DSS file:

1. Select the record or records to copy.
2. From the **Edit** menu, click **Copy To**. The **Copy Records into HEC-DSS File** browser will open, Figure 4.4.

Figure 4.4 Copy Records into HEC-DSS File Browser

3. In the **File name** box, type in a new HEC-DSS filename or select an existing HEC-DSS File you want to copy the record into and click **Open**. A confirmation message will appear stating that the record has been copied to the HEC-DSS file you selected.
4. If the record(s) already exist in that file, a message box will appear asking if you want them to be overwritten, Figure 4.5 (page 4-5).
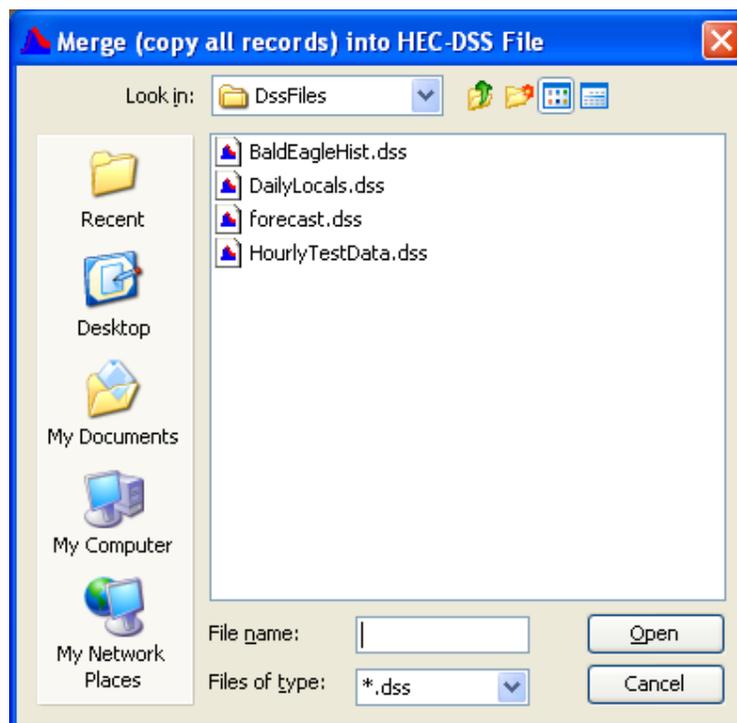
Figure 4.5 Message Box - Overwriting Existing Records

If the number of pathnames is four or less, their names will be displayed in the message box; otherwise they will be printed in the log screen.

4.6   Merging HEC-DSS Files

Merging copies all of the records in the currently opened HEC-DSS file into another. This is similar to selecting all records then using the **Copy Records** option, but is much more efficient. However, this option will overwrite any records with the same pathnames and will not splice together time series records. To merge the current HEC-DSS file into another:

1. From the **Edit** menu, click **Merge (copy)**. The **Merge (copy all records) into HEC-DSS File** browser (Figure 4.6) will open.

Figure 4.6 Merge (copy all records) into HEC-DSS File Browser

2. In the **File Name** box, select an existing HEC-DSS File into which you want to copy all of the records into and click **Open**. A confirmation message will appear stating that the records have been copied into the HEC-DSS file you selected.

4.7   Comparing Data Sets

If you have similar time series data sets, you can compare them and find the differences. The Compare functions will tell you how many values are different and highlight them in a table. You can set options in the compare functions to allow a tolerance between values or compare only where there are valid values for the same times.

You can compare data sets from the **Compare data sets** menu option from the **Edit** menu (Figure 4.7) of a table dialog box. Also, from the DSSVue main window, by selecting the pathnames for those data sets and from the **Tools** menu, pointing to **Compare** and selecting on of the available options.

Figure 4.7 Edit Menu

To compare data sets from a table dialog box:

1. At least two pathnames must be selected for comparing data sets to work. Select the records you would like to compare from the **Selected Pathnames List**. Open a table dialog box, from the **Edit** menu, click **Compare data sets**.
2. A message box will open displaying the number of values that differ in the selected data sets (Figure 4.8) and the differences between the two data sets will be highlighted in red, as show in Figure 4.9 (page 4-7).

Figure 4.8 Number of Different Values

Figure 4.9 Highlight of Differences Between Two Data Sets

To compare data sets from the DSSVue main window:

1. At least two pathnames must be selected for comparing data sets to work. Select the records you would like to compare from the **Selected Pathnames List**. From the **Tools** menu, point to **Compare**, click **Data Sets**, the **Compare Data Sets** message box will open (Figure 4.10).
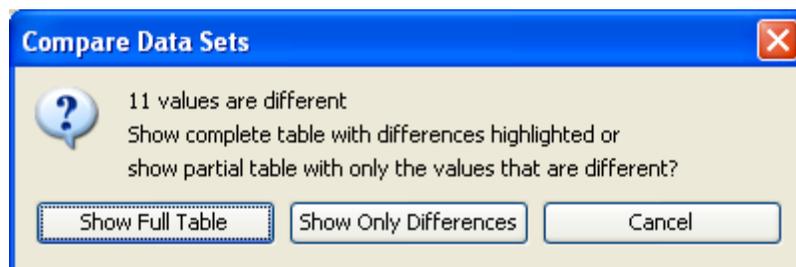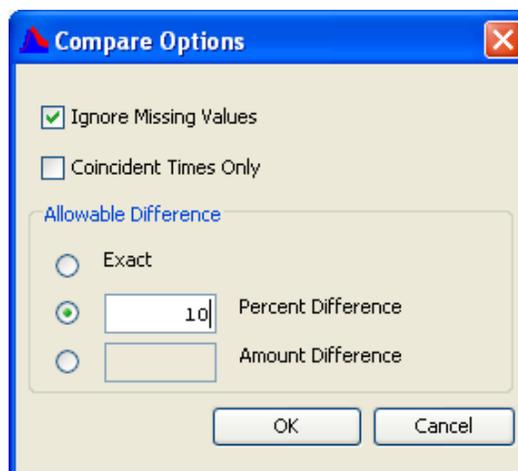

Figure 4.10 Compare Data Sets Message Box

2. To view a complete table of the data sets, click **Show Full Table.** To view a table of only the values that differ, click **Show Only Differences**, as shown in Figure 4.11 (page 4-8).

Figure 4.11 Display Only the Differences in the Data Sets

Comparing data sets can be customized to include tolerance levels, ignoring of missing data, and set to compare only values with matching time steps. To use these options, you must compare data sets from the DSSVue main window:

1. At least two pathnames must be selected for comparing data sets to work. Select the records you would like to compare from the **Selected Pathnames List**. From the **Tools** menu, point to **Compare**, click **Data Sets with Options**, the **Compare Options** dialog box will open (Figure 4.12).

Figure 4.12 Compare Options Dialog Box

2. To ignore all missing values during the compare, check **Ignore Missing Values**. To only compare values at match time steps, check **Coincident Times Only**.

3. In the **Allowable Difference** area of the **Compare Options** dialog, you can change the allowable tolerance for the comparison. By default the comparison uses no tolerance; the **Exact** option is selected. Instead of using the exact value, you can choose to allow a percent by selecting **Percent Difference** and entering a percent value from 0-100 in the field. To set a numerical difference, select **Amount Difference** and enter a value in the field.
4. When you are finished selecting **Compare Options**, click **OK**.
5. The **Compare Data Sets** message box will appear displaying the number of values that differ in the selected data sets (Figure 4.13).
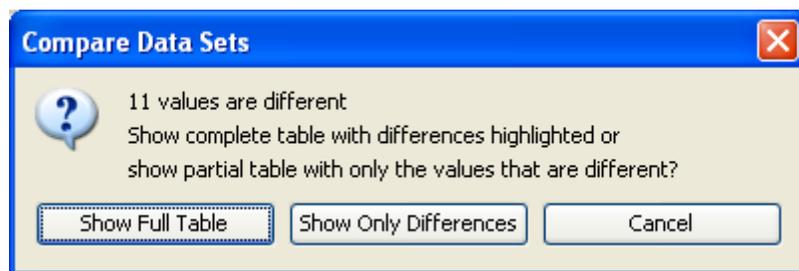

Figure 4.13 Compare Data Sets Message Box

6. To view a table of only the values that differ, click **Show Only Differences**. To view a complete table of the data sets, click **Show Full Table**.

4.8   Comparing HEC-DSS Files

Two HEC-DSS files can be compared to determine the differences of records contained in each file. This is useful in determining if a new version of a program gives the same answers as an older one. Individual or groups of records within the HEC-DSS files can be compared to determine the differences between their data. Options to compare are found under the **Compare** command.

To compare two HEC-DSS Files:

1. The current selected HEC-DSS file, displayed on the selected tab and in the **File Name** field, will be compared to a selected HEC-DSS file you will choose using a file browser. From the **Tools** menu, point to **Compare**, click **Files**, the **Compare to HEC-DSS File** browser open.
2. The **Compare to HEC-DSS File** browser will appear. Use the file browser to select the comparison HEC-DSS file. Once you have selected a file, click **Open**.
3. A message box will display (see Figure 4.14, page 4-10) , summarizing the number of records contained in both of the HEC-
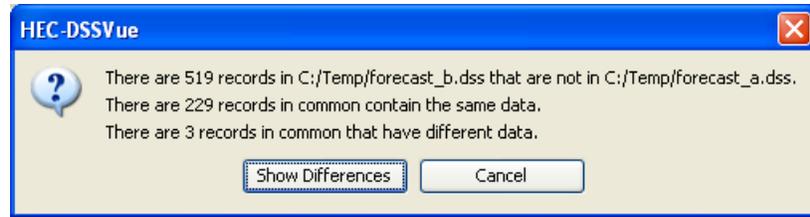
Figure 4.14 File Comparison Result Message Box

DSS files. To view a list of the different records, click **Show Differences**.

4. The **Differences** window will appear listing all the records that are different between the two files as in Figure 4.15.
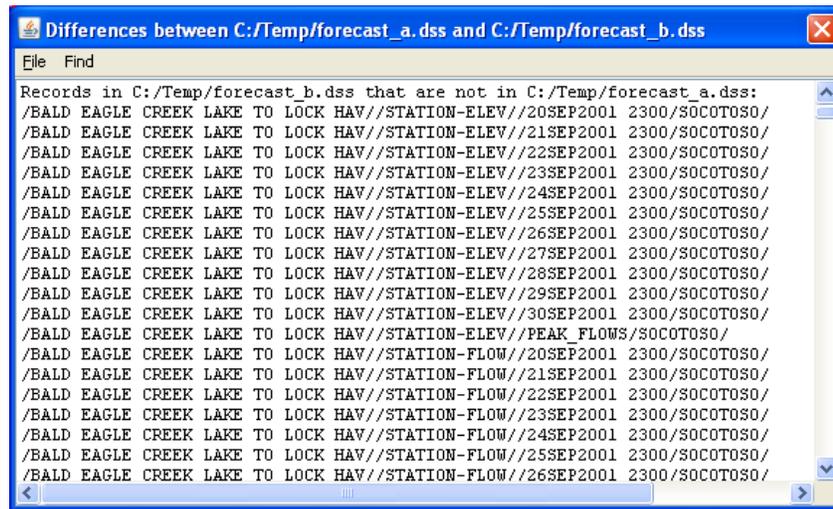

Figure 4.15 Comparing Files - List of records that are different between files

5. The **Compare Records** dialog box will open (Figure 4.16) that lists records in common between the two files that contain different values. If you want to set a tolerance to compare values with, press the **Options** button.

Figure 4.16 Compare Record Dialog Box

6. The **Compare Options** dialog box (see Figure 4.17, page 4-11) allows you to set options to compare values by ignoring missing values (where both values are non-missing) for the same times,
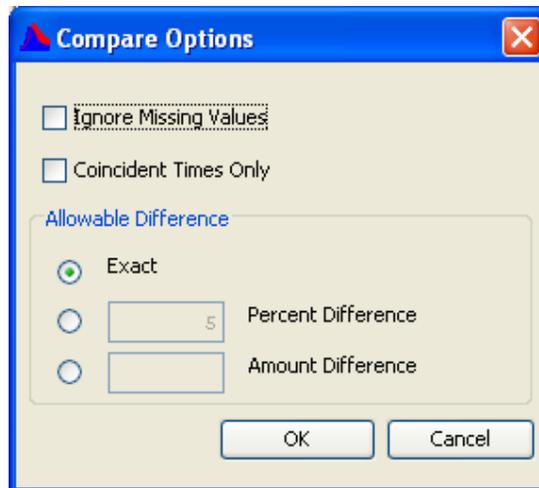
Figure 4.17 Compare Options Dialog Box

compare values for coincident times only (where there are valid values in both data sets at the same time), and set a tolerance to compare between numbers. For the tolerance, you can set a percent amount that values can differ by or an absolute value that they can differ.

7. When you select the records that you want to compare and press the **Compare Records** button, a table showing the differences for each pair will be displayed. Values that are different are highlighted in red for the file that you are comparing to, as shown in Figure 4.18.

Figure 4.18 Comparison of Data Sets

4.9   Searching for a Value

You can search for a value in time series and paired data sets. You can set a tolerance to search within or you can search for values less than or greater than a specified number.

You can tabulate the records that match your specifications. Those values will be highlighted in red. To search for a value:

1. Select the data sets that you want to search. From the **Tools** menu, click **Search for Value**, the **Enter Value to Search for** dialog box will open (Figure 4.19).
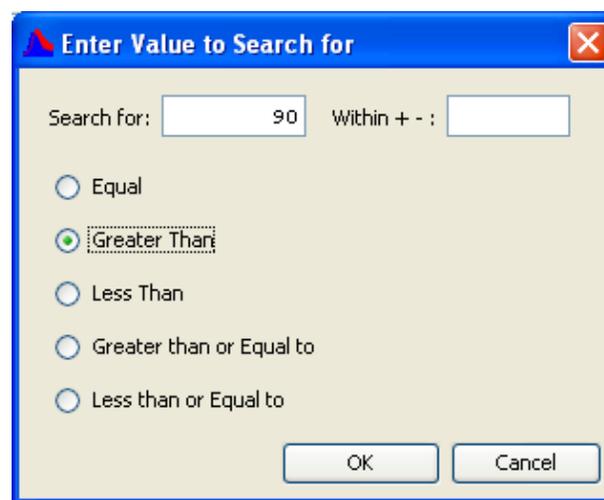

Figure 4.19 Enter Value to Search for Dialog Box

2. From the **Enter Value to Search for** dialog, enter the value you would like to find in the **Search for** box. If you would like to search within a tolerance for this value, enter the range in the **Within +-** box.
3. By default, the search is set to find the exact value, give or take the **Within** value. However, you can choose to search for values **Greater Than**, **Less Than**, **Greater than or Equal to**, or **Less than or Equal to** the Search for value.
4. Once you are finished selecting your search criteria, click **OK**.
5. The **Found Values** message box will appear (Figure 4.20) listing all selected data sets that meet your search criteria.
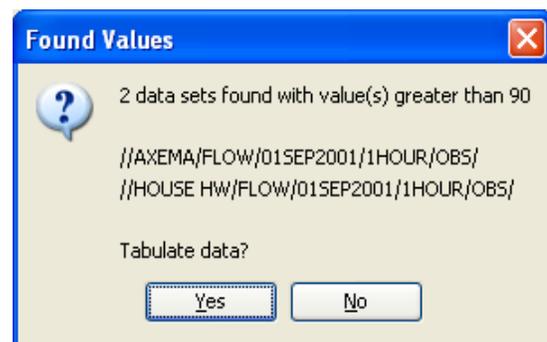

Figure 4.20 Found Values Message Box

6. To tabulate the search findings, click **Yes** on the **Found Values** window. A table will display listing all values that meet the search criteria in red, see Figure 4.21 below.

Figure 4.21 Found Values from Search

4.10   Checking File Integrity

You can check to see if a database has been damaged. Generally, this is rare but occasionally a file can be damaged from disk problems, errant programs lost file links or other situations. Checking file integrity is similar to a "Check Disk" in Microsoft Windows.

In addition to checking for damage, checking file integrity will tell you if you can improve efficiency by squeezing the database. However, it is usually faster just to squeeze the database than to check for it.

Checking file integrity is a thorough and comprehensive process, so it will take time.

To check the integrity of an HEC-DSS file:

1. Open an HEC-DSS file, from the **Tools** menu, click **Check File Integrity**.
2. For larger files, the Database Integrity Check dialog box (Figure 4.22) will open providing the status of the operation. There are four major steps in the operation. You can cancel at anytime without hurting anything. Generally, the process goes faster once the first step has been completed.
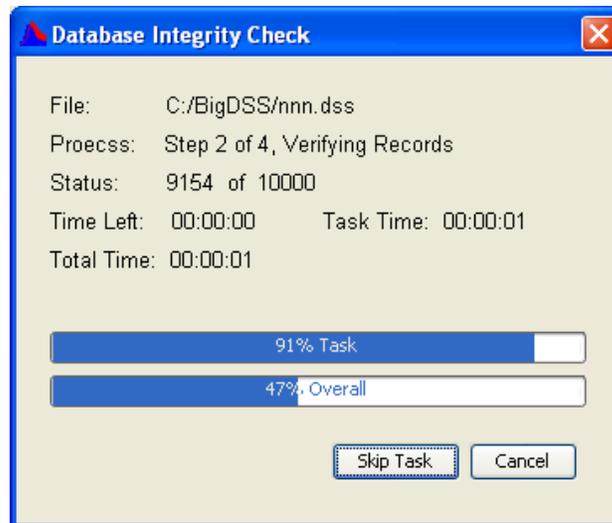

Figure 4.22 Database Integrity Check Dialog Box

3. A status report message window will open (Figure 4.23) after the integrity check has finished. To view the integrity report, click **View Log**.
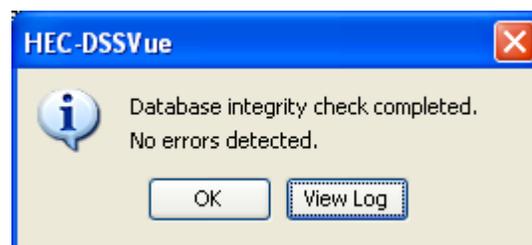

Figure 4.23 Status Report Message Window

4. If any errors in the database are detected, a message window saying so will be displayed (see Figure 4.24, page 4-15). Due to the comprehensive nature of the check, an error is usually reported for several processes within the check, so the total number of errors reported can be substantially more than there really are.

If an error is detected, it is recommended that you make a backup of your file and then squeeze the file. Squeezing rebuilds the file, using a brute force approach that should retrieve all data possible
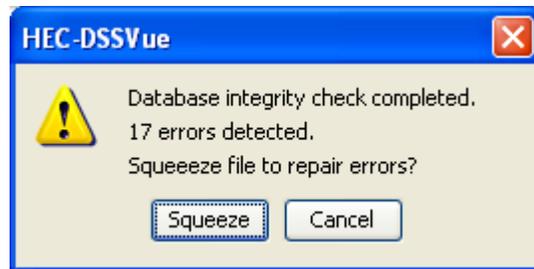
Figure 4.24 Error from Database Integrity Check

within the file. You should review any critical data after you have squeezed it, as the same event that broke links within the file may have changed data values also.

5. If you have a lot of unused space due to deletions or other actions or the internal tables are not suited well to the number of data sets, a message will be displayed saying so. (Figure 4.25) It is recommended that you squeeze the file to remove unused space and rebuild the internal tables.
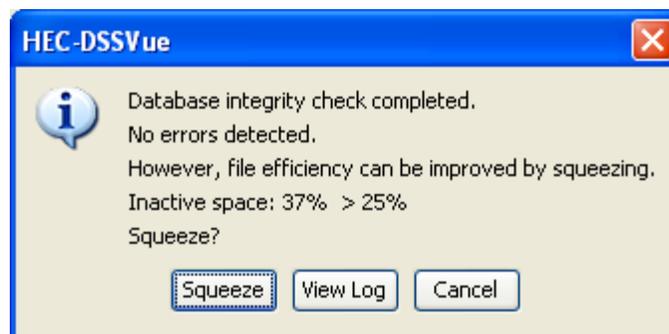

Figure 4.25 Status Report Message After Data Sets are Deleted

4.11   Squeezing an HEC-DSS File

When you delete or rename records, a HEC-DSS file will accumulate inactive space. The **Squeeze** command removes inactive space by copying all valid data to a new file then renaming the new file to the old filename. The **Squeeze** command will also automatically re-adjust internal HEC-DSS table sizes to optimize access to the data. This is similar to de-fragmenting your file system.   Once a squeeze has been accomplished, deleted data cannot be recovered.

To squeeze an HEC-DSS file:

1. Open an HEC-DSS file, from the **Tools** menu, click **Squeeze**. A window will appear indicating the status of the squeeze process.
2. If you wish, you may cancel the squeeze prior to completion, by clicking **Cancel**.

3. When the process is complete, a confirmation will appear (Figure 4.26).

Figure 4.26 Squeeze Confirmation Window

4.12   Scripting

You can use Jython scripts that you or others write to perform math functions, create custom plots or tables, and automate repetitive tasks. To edit, test, and select scripts, use the **Script Editor** (Figure 4.27). To access the **Script Editor**, from the **Tools** menu, click **Script Editor**.
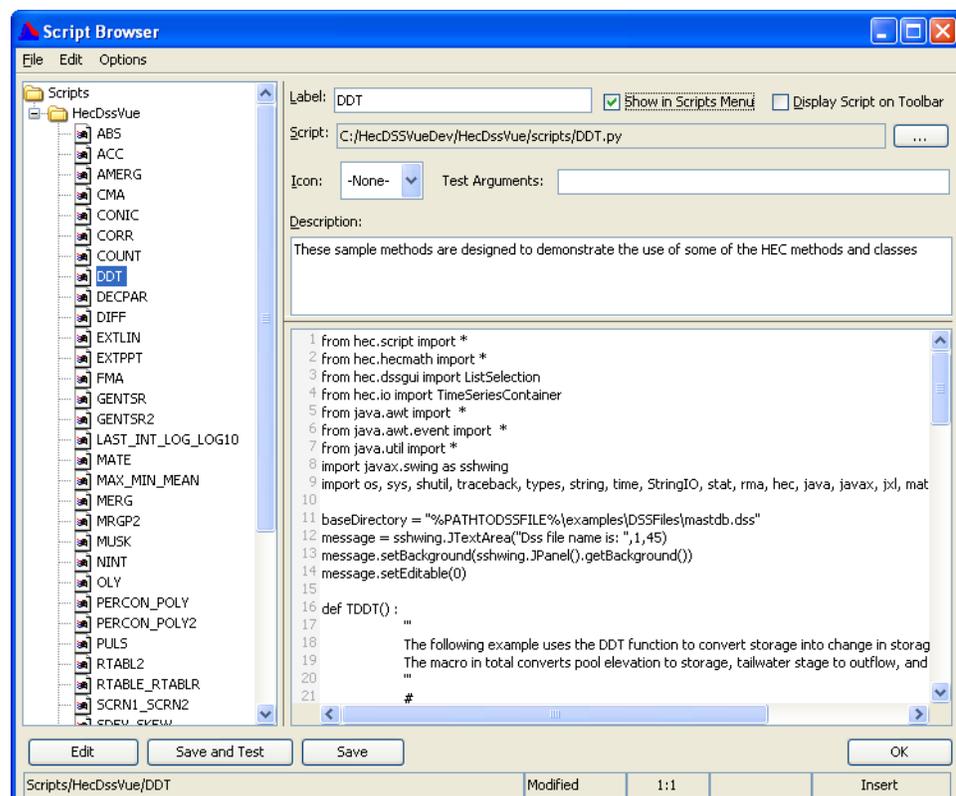

Figure 4.27 Script Editor

To run scripts that have already been setup, use the **Script Selector** dialog box (Figure 4.28). To access the **Script Selector** dialog box, from the **Tools** menu, click **Script Selector**. For more information, refer to the chapter on **Scripting**.

Figure 4.28 Script Selector Dialog Box

4.13   Catalogs

The list of pathnames on the main screen is a modified version of the
HEC-DSS Catalog. A catalog is essentially a list of record pathnames in a
DSS file, organized in one of several ways. Because a catalog is separate
and not really part of the DSS file, it only reflects the state of the DSS file
the last time it was updated. Whenever you add a new record to the
database, the catalog becomes out of date; the catalog is not updated as it
would be prohibitively slow.

The new version of HEC-DSSVue retrieves an internal listing of
pathnames to show in the main window.   However, since it takes time to
sort and order them, a cache disk file is usually saved, and only updated
when it is detected to be out of date. For larger DSS files, HEC-DSSVue
will ask the user if they want to spend the time to have it updated when it
becomes out of date.

This section covers the three primary forms of catalogs that can be stored
on disk and viewed or printed. A full catalog is a listing of all record
pathnames in the file, along with their last written date and time, their
version, the number of data they contain and the type of data it contains.
An abbreviated catalog contains just the record pathnames and a
condensed catalog groups dates for time series data and just shows a date
span for the date part of a time series data set.

4.13.1   Condensed Disk Catalog

A condensed catalog is a list of pathnames where the dates of time series data are grouped together and show a date span instead of a date D part for each record.

To create a condensed catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Condensed Disk Catalog**, click **New**.
2. A message box will appear stating the catalog has been updated and the number of records it contained (Figure 4.29).

Figure 4.29 Catalog File Update Message Box

To view a condensed disk catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Condensed Disk Catalog**, click **View**.
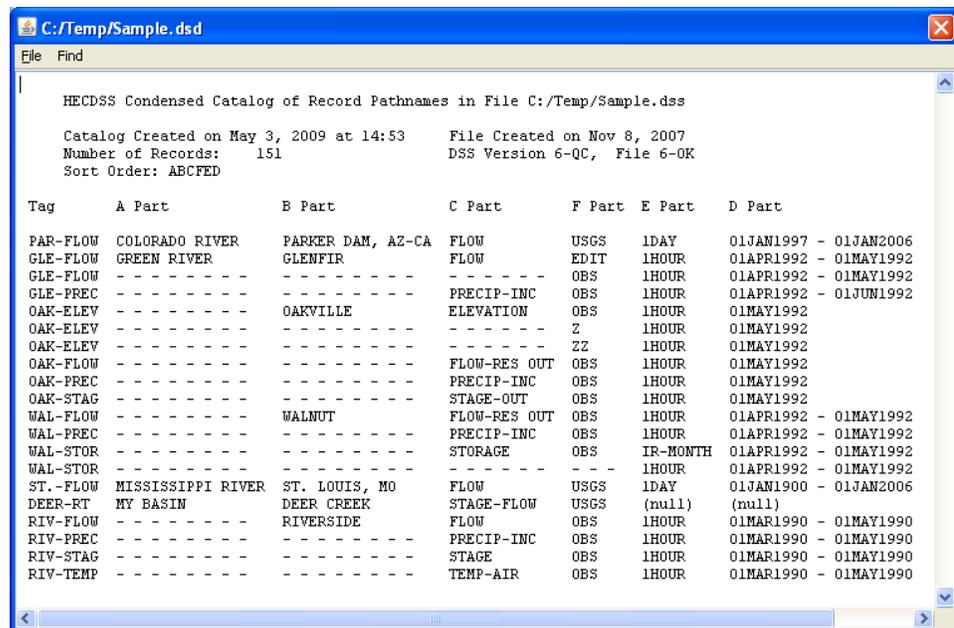2. A text dialog box will open (Figure 4.30) displaying the condensed disk catalog.

Figure 4.30 Condensed Catalog Text Output

3. You can print the catalog from the text dialog, from **File** menu, click **Print**.
4. From the text dialog, you can perform several file management functions: **Insert .txt**, **Save As .txt**, change the **Font**, and **Print Setup**. It also contains a **Find** menu that can facilitate a search of the catalog displayed.

To print a condensed disk catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Condensed Disk Catalog**, click **Print**.
2. A **Print** dialog box will open (Figure 4.31); click **OK** to send the catalog to the printer.

Figure 4.31   Print Dialog Bo**x**

4.13.2   Abbreviated Disk Catalog

An abbreviated catalog is a sorted list of record pathnames in a HEC-DSS file.

To create an abbreviated catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Abbreviated Disk Catalog**, click **New**.
2. A message box will appear stating the catalog has been updated and the number of records it contained (see Figure 4.29, page 4-18).

To view an abbreviated catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Abbreviated Disk Catalog**, click **View**.
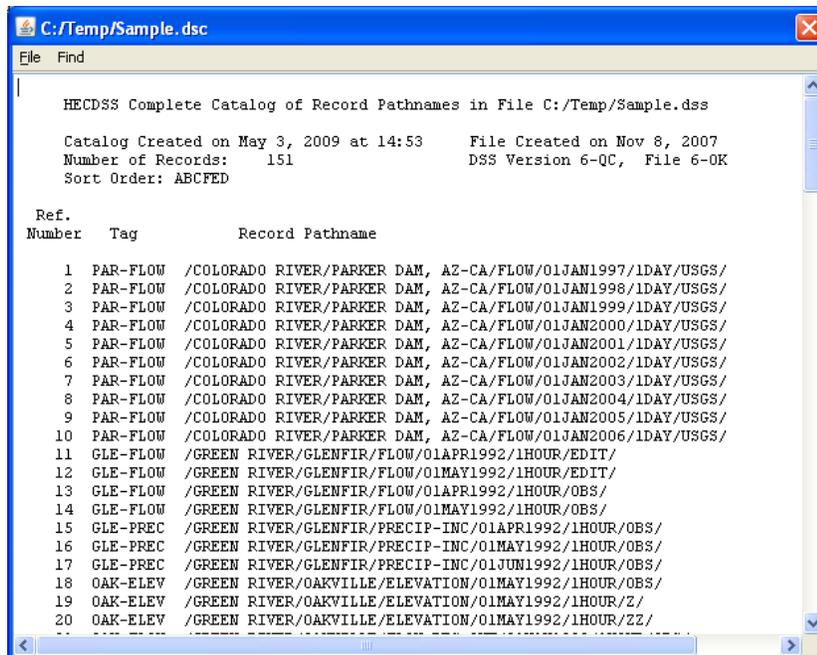2. A text dialog box will open (Figure 4.32) displaying the abbreviated disk catalog.

Figure 4.32 Abbreviated Catalog Text Output

3. You can print the catalog from the text dialog, from **File** menu, click **Print**.
4. From the text dialog, you can perform several file management functions: **Insert .txt**, **Save As .txt**, change the **Font**, and **Print Setup**. It also contains a **Find** menu that can facilitate a search of the catalog displayed.

To print an abbreviated catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Abbreviated Disk Catalog**, click **Print**.
2. A **Print** dialog box will open (see Figure 4.31, page 4-19); click **OK** to send the catalog to the printer.

4.13.3   Full Disk Catalog

A Full Catalog is a listing of all record pathnames in the file, along with their last written date and time, their version, the number of data they contain and the type of data it contains.

To create a full catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Full Disk Catalog**, click **New**.
2. A message box will appear stating the catalog has been updated and the number of records it contained (see Figure 4.29, page 4-18).

To view a full catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Full Disk Catalog**, click **View**.
2. A text dialog box will open (Figure 4.33) displaying the full disk catalog.

Figure 4.33 Full Disk Catalog Text Output

3. You can print the catalog from the text dialog, from **File** menu, click **Print**.
4. From the text dialog, you can perform several file management functions: **Insert .txt**, **Save As .txt**, change the **Font**, and **Print Setup**. It also contains a **Find** menu that can facilitate a search of the catalog displayed.

To print an abbreviated catalog:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Full Disk Catalog**, click **Print**.
2. A **Print** dialog box will open (see Figure 4.31, page 4-19); click **OK** to send the catalog to the printer.

4.14   Viewing the Console Output

As the HEC-DSSVue application is running, it generates application runtime and DSS file output. To view the output for the current instance of

the HEC-DSSVue application, from the **Advanced** menu, click **Console Output**. The **Console Output** dialog box will open (Figure 4.34).
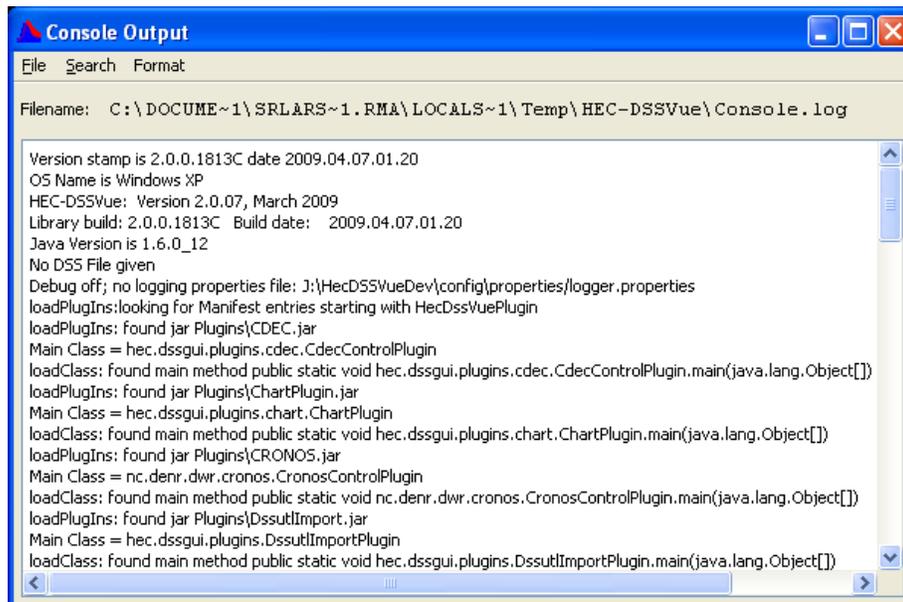

Figure 4.34 Console Output Dialog Box

4.15　　Viewing HEC-DSS File Output

To view the output generated by HEC-DSS file interaction, from the **Advanced** menu, click **DSS Output**. A basic text dialog box will open (Figure 4.35) displaying application process information on the DSS file.
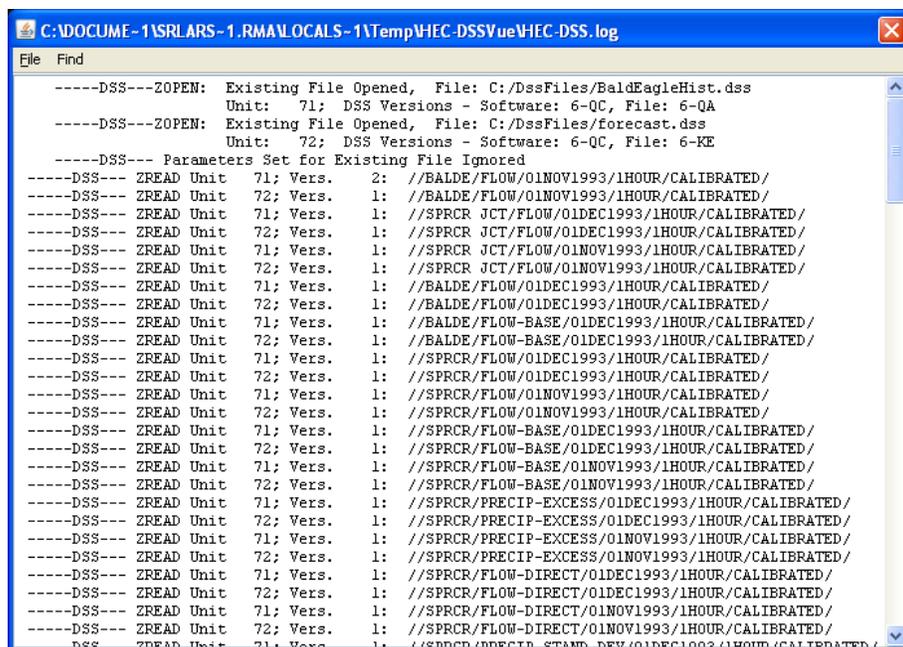

Figure 4.35 DSS Output Dialog Box

4.15.1   Program Options

During the process of using HEC-DSSVue, properties are saved to maintain a memory of HEC-DSS file history, UI settings, and user preferences. **Program Options** allow you to re-set any such properties back to the default settings that were set when HEC-DSSVue was first installed. Other **Program Options** include required files to import/export SHEF data. For more information on the SHEF tab, see Chapter 5.

To reset all default properties for HEC-DSSVue:

1. Open an HEC-DSS file, from the **Advanced** menu, click **Program Options**, the **Options** dialog box will open (Figure 4.36).
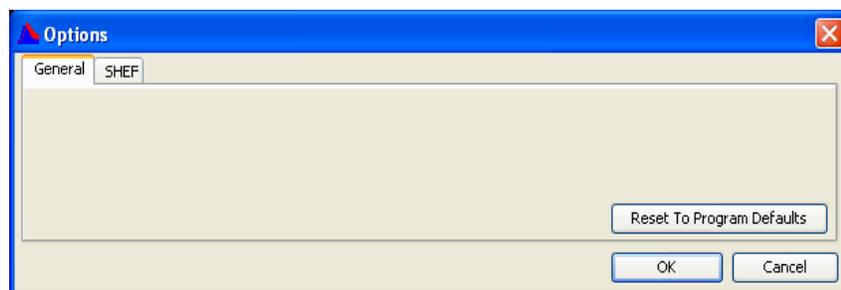

Figure 4.36 Options Dialog Box - General Tab

2. On the **General** tab, click the **Reset To Program Defaults** button.
3. A **Reset all Program to Default** message box will appear (Figure 4.37), verifying you would like to reset the defaults. Click **Yes**.
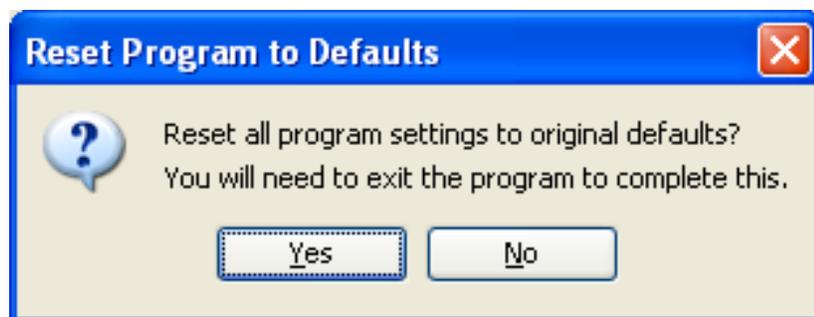

Figure 4.37 Reset Program to Defaults Message Box

4. Once the program defaults have been set, a message will open asking you to exit HEC-DSSVue to complete the reset process (Figure 4.38). Clicking **Yes** will close HEC-DSSVue, or you can choose to exit HEC-DSSVue later by clicking **No**. If you select **No**, some program settings may remain.
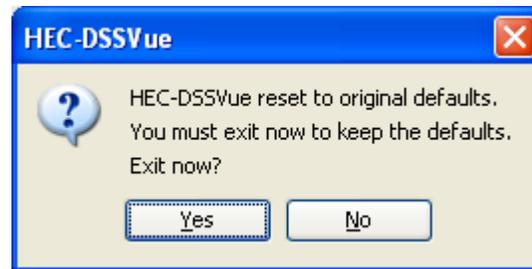
Figure 4.38 Reset Program to Default Confirmation
Window

4.16   Advanced Functions

The following sections provide internal information, generally only for
internal use. They involve examining and modifying internal file structure
and settings, changing the trace and output levels, and setting internal
flags in HEC-DSS. They are not intended for general use.

4.16.1   Memory Monitor

A set amount of memory is allocated for use during the HEC-DSSVue
application runtime. The **Memory Monitor** (Figure 4.39) displays the
real-time memory used by the HEC-DSSVue application in relation to the
memory the program has allocated. To access it, from the **Advanced**
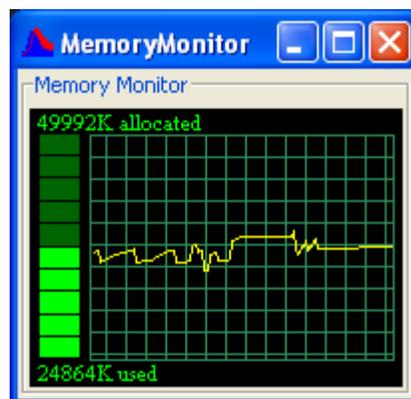menu, point to **Status**, click **Memory Monitor**.

Figure 4.39 Memory Montior

4.16.2   Open List of HEC-DSS Files

A report listing the current open HEC-DSS file in HEC-DSSVue is
available from the **Advanced** menu, point to **Status**, click **DSS Files
Opened**. The report, Figure 4.40 (page 4-25), lists the DSS Trace date
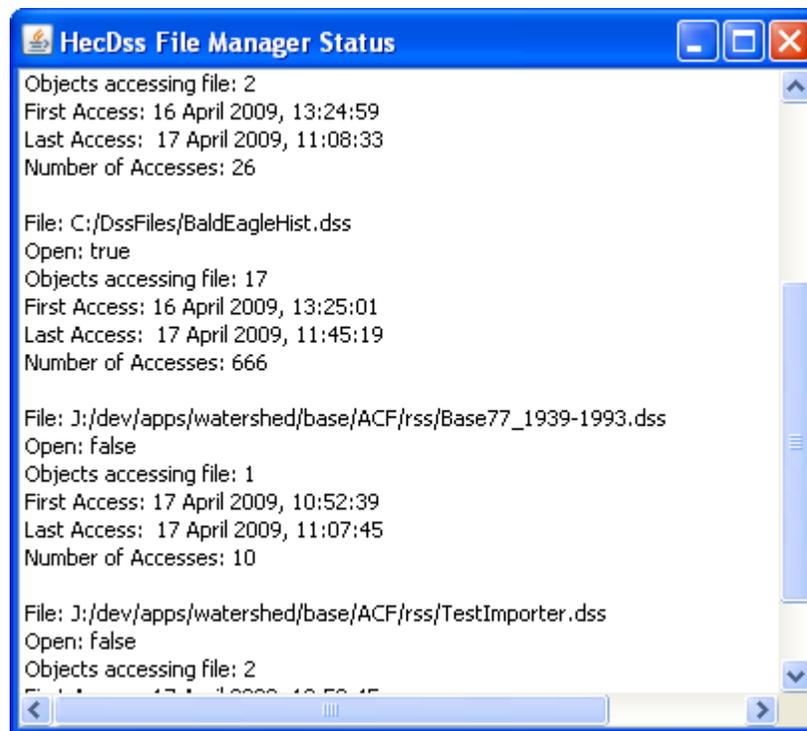and time and how many files were accessed. It also contains access

Figure 4.40 HecDSS File Manager Status

information for each file, the number of records accessed, how many of these records are currently selected, the file path to the HEC-DSS file that contains the file access information, and the number of records accessed for the current session of HEC-DSSVue.

4.16.3   Viewing the DSS Header List

The DSS Header List displays all the database variables and their values used for the current HEC-DSS file.

To view the header list:

1. Open an HEC-DSS file, from the **Advanced** menu, point to **Status**, click **DSS File Header**.
2. A dialog box will open (see Figure 4.41, page 4-25) listing all the headers set for the current HEC-DSS file.

4.16.4   HEC-DSS File Internals

HEC-DSSVue offers tools to aid in viewing information on the current HEC-DSS file and debugging problems that might occur during runtime. These tools include increasing the **Message Level, DSS ZSET, DSS ZINQIR**, and **Debug/Examine File**. The **Debug** options are intended to

be used internally only. For more information see the separate HEC-DSS Programmer's Manual.

Message Levels

Message Levels control the detail of the messages written out to the HEC-DSSVue Console Output. The higher the Message Level, the more messages and detail will be written. A normal setting is four; above that provide debugging output. This setting is intended to be used by programmers only. For more information on the **Message Levels,** see the separate **HEC-DSS Programmer's Manual**.

DSS ZSET

DSS ZSET is a tool for programmers to set file parameters. For more information on the **DSS ZSET,** see the separate **HEC-DSS Programmer's Manual**.

DSS ZINQIR

DSS ZINQIR is a tool for programmers to query file parameters. For more information on the **DSS ZINQIR,** see the separate **HEC-DSSVue Programmer's Manual**.

Debug/Examine File

The Debug/Examine File displays the internal contents of a HEC-DSS file for internal use. Modifying values in this dialog can damage files.