Appendix F: SAM.Aid—Guidance in Sediment Transport Function Selection

F-1. SAM.aid is on the Tools dropdown menu in SAMwin. Figure F-1 shows the opening screen for SAM.aid. There are three kinds of information on this screen: commands; input data; and output data. Only D50, Slope, Velocity, Width, and Depth can be input, but they do not have to be input manually. They can be read from a SAM.sed input file. If a SAM.sed input file is read, the 5 "input" areas, in the "Criteria Data" section of the screen, will be filled with data. The output areas are the two large, now blank, gray areas.
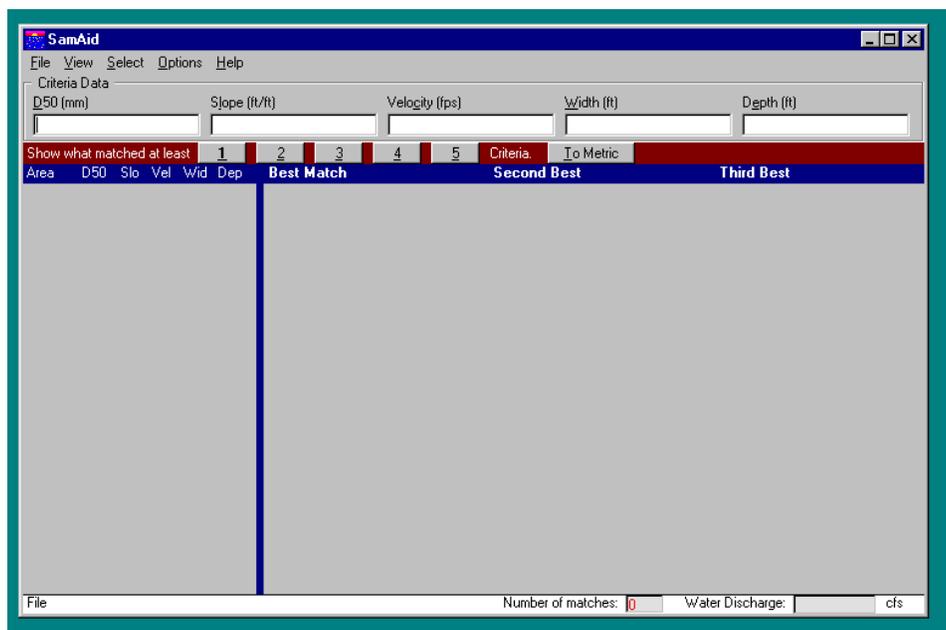
Figure F-1. SAM.aid Main Screen.

F-2. Using SAM.aid. The flow of events through SAM.aid is straightforward:

1. Read in an input file using the File dropdown menu or enter data in each of the 5 input areas.
2. If an input file has been read in, select a "data set," Figure F-2.
3. Review the listed best functions to use, checking the description of the Brice data, Figure F-6.
4. Turn on the desired functions -- Figure F-4 or Figure F-5.
5. Save the input file, exit, and run SAM.sed.

The most advantageous way to utilize SAM.aid is to go through steps 1 through 3 several times, examining several ranges of data within the input file.

F-3. The "File" dropdown menu offers standard choices. With the "View" dropdown menu the user can choose the display results or may view any of the Brice data set descriptions. With "Select," the user can select a Data Set or a sediment transport function. The "Options" menu allows the user to choose English or metric units, and to set two configuration choices for ease in running. In the "Configure Options" the user can set a startup folder, or not, and also check whether or not to write the last used filename to the FILES.SAM file on exiting SAM.aid. The FILES.SAM file sets the input data file SAM.sed will use when run. The "Help" menu provides rudimentary information on using SAM.aid as well as information on the version, and creation, of the program.

F-4. View Menu. The user can choose how to view results – choosing to display only results that matched 1, 2, 3, 4, or all 5 parameters. This can also be accomplished by mouse clicking a number on the line above the output areas. The "Area Information" choice on this dropdown menu allows the user to view information on any Brice data set in the program, see Figure F-6.

F-5. Select Menu. The dropdown menu offers two choices, "Data Set…" or "Transport Function…" A mouse click on "Data Set…" will bring up the Select Data Set screen, Figure F-2. This screen appears automatically when a SAM.sed input file is opened, and will stay available. This dropdown menu choice is convenient if the user wishes to reopen the Select Data Screen once it has been closed.
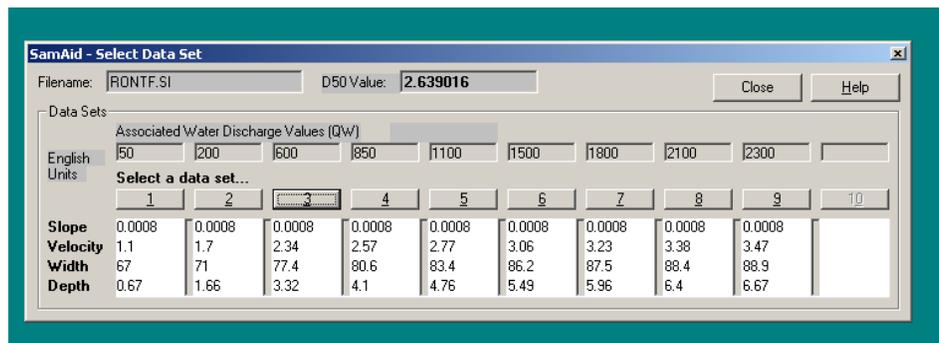
Figure F-2. Select Data Set screen showing input read from a file.

This screen echoes the data from the input file selected, arranging the information into columns of related slope, velocity, width, depth, and water discharge. The D50 value shown on the screen is calculated from the bed gradation information (the PF-records) in the input file. Data cannot be changed on this screen. Using the mouse to select a column will highlight the button for that column and cause the program to present the suggested transport functions for that one column of data, as in Figure F-3. The user selects one column of related data at a time to be used in the SAM.aid comparison. The Select Data Set screen stays visible. This is a convenient aid to comparing the results from selecting different columns. Figure F-3 shows the Select Data set screen with the results of a column selection on the main screen.

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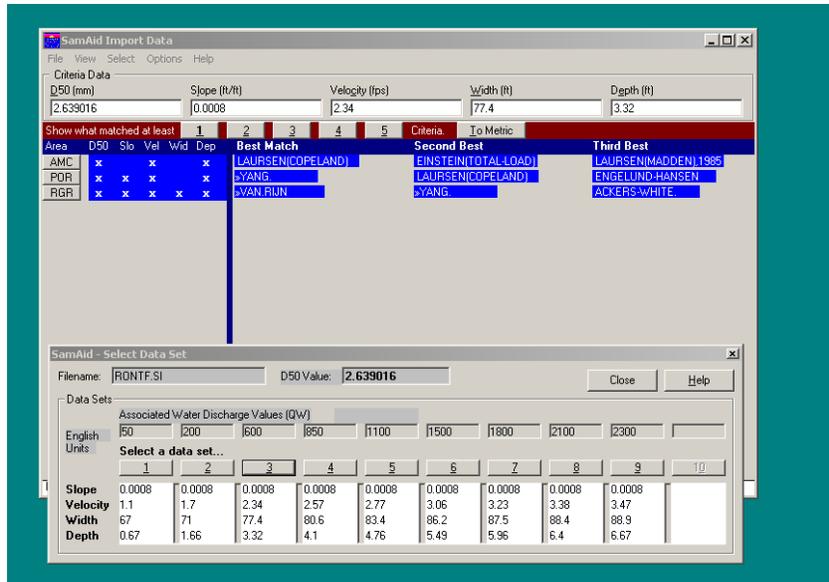
Figure F-3. Select Data screen with results.

Choosing "Transport Functions…" brings up the screen in Figure F-4. Any sediment transport function can be turned on or off in the input file by clicking on the function name.
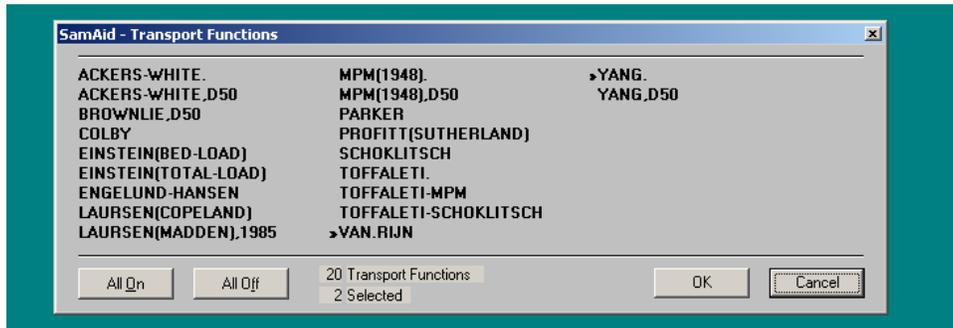
Figure F-4. Transport Functions screen, showing 2 functions selected.

If a ">" appears next to the name, as by "YANG" and "VAN.RIJN" in Figure F-4, then the function will be turned on in the input file. Mouse clicks toggle the functions on and off. The selections made on this screen are transferred to the main screen once "OK" is selected. They are transferred to the input file when the user saves the file.
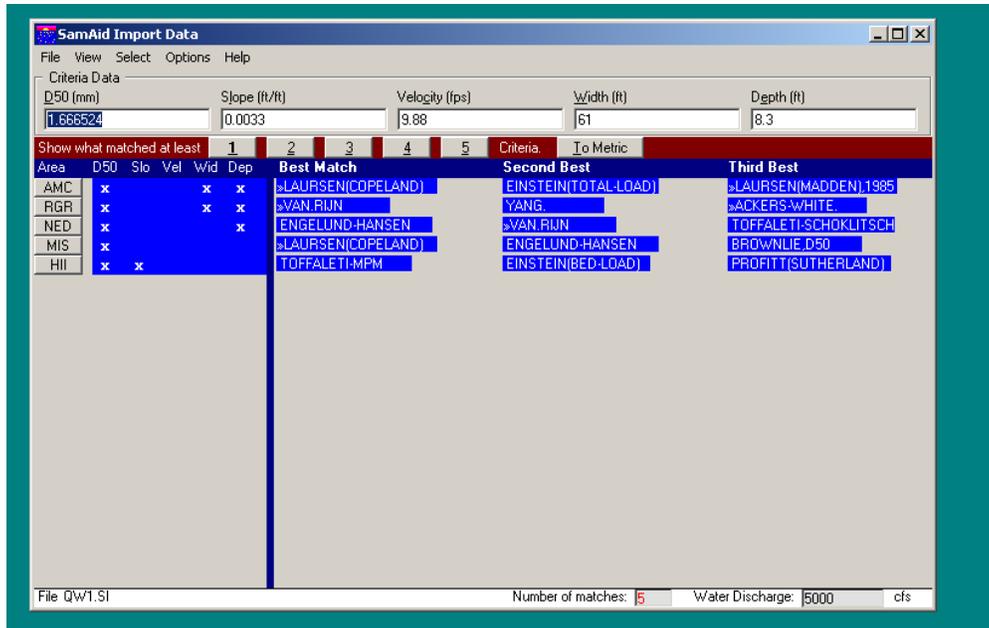
Figure F-5. SAM.aid output screen

The output screen, shown in Figure F-5, lists the various sediment transport functions that are recommended by SAM.aid. The parameters of the chosen "column" from the input file are echoed in the "Criteria Data" area. The parameters from this data that that fell within the data ranges of the listed Brice data sets are checked with an "x". The transport functions that are turned on in the input file are marked with a small ">>". A mouse click on a function name on this screen will toggle that function on and off.

The "Area" column lists the Brice data set that matched the marked parameters with the input file chosen. Each button has a 3-letter identifier. The complete list of abbreviations and names is in the SAM.aid chapter of the "SAM User's Manual," or can be viewed by clicking the "View\Area Information" on the main menu. A mouse click on a button will display information on that Brice data set as well as the data ranges and the parameters on which each sediment transport function was rated, Figure F-6. The scroll arrows and bar on the side of this screen allow the user to access all information about, in this case, COL – the Colorado River Data of the U.S. Bureau of Reclamation (1958), including the ranges of the data and statistical parameters of the results of the attempt of each function in SAM.sed to reproduce this data.
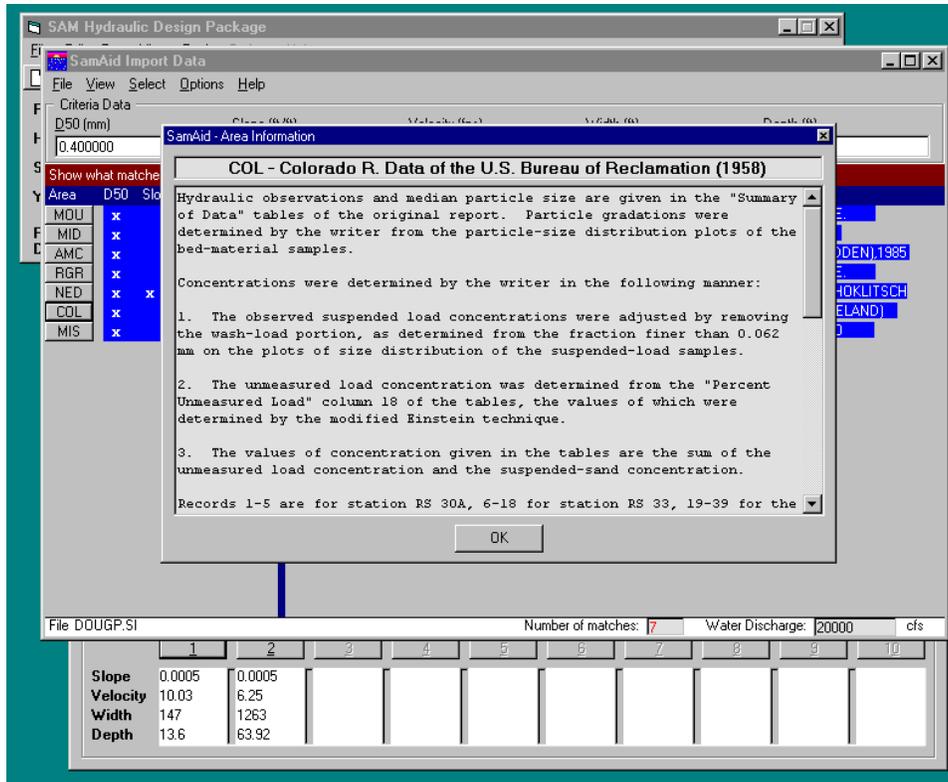
Figure F-6. Example Area Information Screen, shown as it appears over other screens.

F-6. Saving. Once the user is satisfied with the functions selected through this process, the "File" dropdown menu offers "Save," "Save as…" and "Exit" options. As discussed in F-3, the filename saved here can be written to a file that will cause this SAM.sed input file to be used when SAM.sed is run.