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Importing Water Surface Profiles

The HEC-FDA program can import water surface profile (WSP) data generated by the HEC-2, Water Surface Profiles program (USACE, 1991) or the River Analysis System (HEC-RAS) program (USACE, 1997). Data are imported by selecting “Import” from the File menu on the Study Water Surface Profiles screen. See Figure C.1.

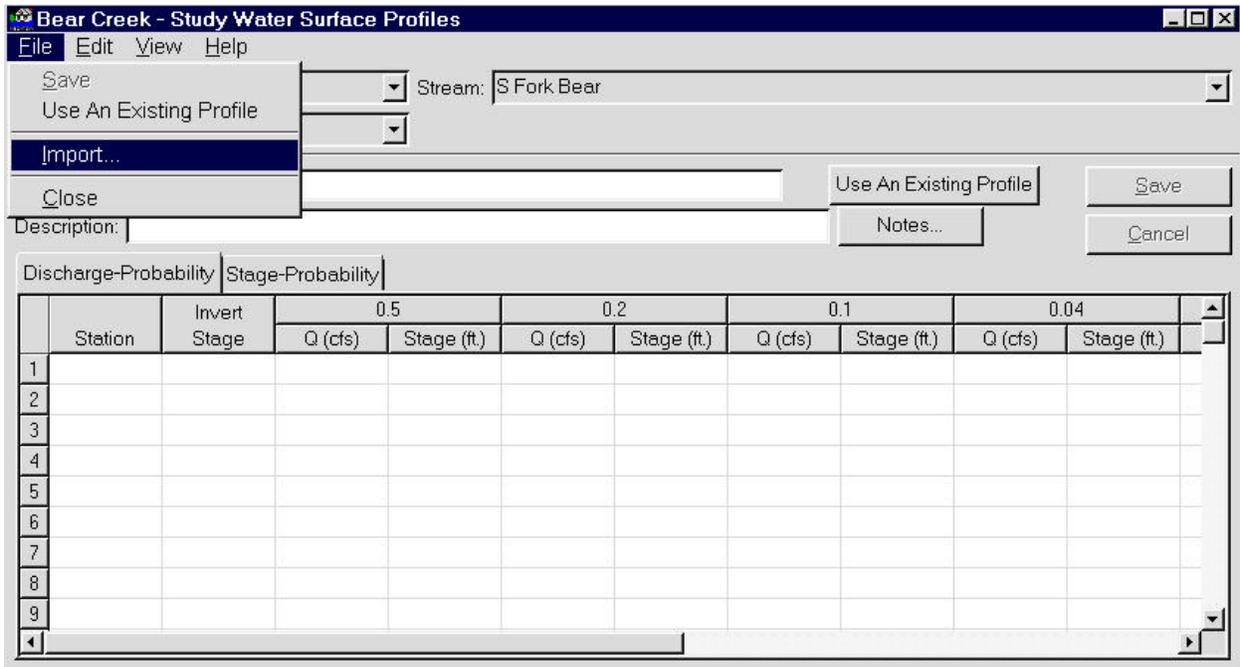


Figure C.1 Importing Water Surface Profile Data

When the Import is selected, a window comes up for specifying file type and name. See Figure C.2.

One of two file types can be specified in the “Files of type” box by selecting the down arrow. HEC-RAS files have the extension “*.wsp”, HEC-2 (SUMPO) files have the extension “*.smp”. When the file type is selected, the open file dialog window will display files with the file type extension that are located in the indicated directory. Once the appropriate water surface profile data file is selected, “Open” will cause the data to be imported to the HEC-FDA program (See Figure C.3).

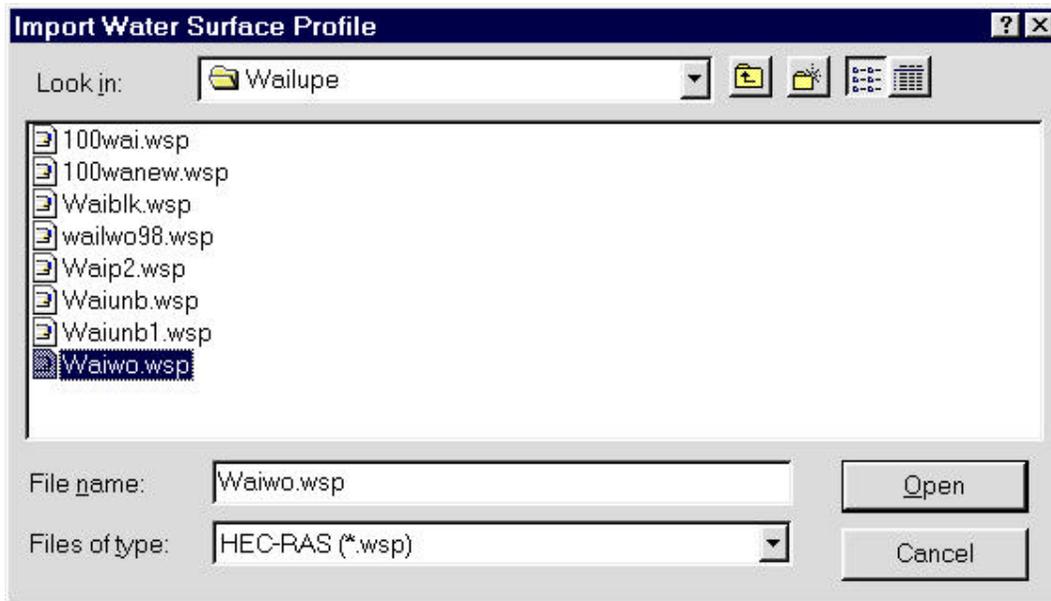


Figure C.2 Import Water Surface Profile Screen

Bear Creek - Study Water Surface Profiles

File Edit View Help

Plan: Without Stream: S Fork Bear

Analysis Year: 1999

Profile: SF Bear W/O Base Use An Existing Profile Save

Description: SF Bear Crtreek W/O Project - Base Yr Notes... Cancel

	Station	Invert Stage	0.5		0.2		0.1		0.04	
			Q (cfs)	Stage (ft.)						
1	0.800	416.50	2790	424.68	4030	426.58	5530	428.56	7100	430.39
2	0.820	416.10	2790	424.81	4030	426.70	5530	428.67	7100	430.48
3	0.820	416.10	2790	424.87	4030	426.78	5530	428.75	7100	430.58
4	0.860	416.00	2790	424.93	4030	426.86	5530	428.92	7100	430.82
5	0.920	415.70	2790	425.35	4030	427.36	5530	429.31	7100	431.05
6	0.980	415.50	2790	425.86	4030	427.89	5530	429.88	7100	431.64
7	1.000	415.40	2790	425.59	4030	427.44	5530	429.17	7100	430.65
8	1.010	415.40	2790	425.69	4030	427.51	5530	429.19	7100	430.57
9	1.030	415.50	2790	426.43	4030	428.65	5530	430.93	7100	433.05

Figure C.3 Imported Water Surface Profile Data

These data define exceedance probability and stage-discharge function at damage reach index locations within the FDA program. WSP data is also used to compute aggregated stage-damage functions at index locations based on structural inventory data.

The following sections describe how to generate WSP data files for importing.

Importing Water Surface Profile Data from HEC-2

After the HEC-2 program has been used to compute multiple-profiles for eight frequency-based flows, the Summary Printout (SUMPO) program is used to create a text file of the water surface profile data for importing into the FDA program. The SUMPO program is part of the HEC-2 package.

The SUMPO program is selected as the run command choice in the HEC-2 Package Menu. The following steps are taken to create a text file of the WSP data to import:

- # When the SUMPO screen comes up “Create summary tables” is selected from the menu.
- # The variables Section Number (SECNO), Total Discharge (Q), Minimum Cross-Section Elevation (ELMIN), and Computed Water Surface Elevation (CWSEL) are selected, in that order, for the summary table.
- # “O” is selected to write the summary table to a file.
- # Select all or the appropriate cross-sections for the stream by answering the question “Output all cross sections (y/n)?”, with “y” for yes.
- # Select the profiles in the same manner by answering the question “Output all profiles (y/n) ?”, with “y” for yes.
- # Answer “No” to, “Include summary errors in output (y/n) ?” and, “Append output to output file (y/n) ?”
- # Press <Enter> to generate the report.

The file name will be the same as your input data file with an extension of .SMP unless it is changed by selecting “Define files & printer width” in SUMPO. Once the table is generated, check the results to see if it included the eight profiles and the stations for the stream of interest by displaying the file to the console or viewing it with a text viewer or editor. An example of a portion of a SUMPO text file is shown in Figure C.4.

```

*-----*
  S U M P O
Interactive Summary Printout
for MS-DOS/PC-DOS micro computers
Sept 1988 version (9/89 update)
*-----*
  
```

NOTE - Asterisk (*) at left of profile number
 indicates message in summary of errors list

SOUTH FORK BEAR CREEK

Summary Printout

SECNO	Q	ELMIN	CWSEL
.80	2790.00	416.50	424.68
.80	4030.00	416.50	426.58
.80	5530.00	416.50	428.56
.80	7100.00	416.50	430.39
.80	8100.00	416.50	431.39
.80	9550.00	416.50	432.90
.80	10620.00	416.50	433.92
.80	12870.00	416.50	435.88
.82	2790.00	416.10	424.81
.82	4030.00	416.10	426.70
.82	5530.00	416.10	428.67
.82	7100.00	416.10	430.48
.82	8100.00	416.10	431.47
.82	9550.00	416.10	432.95
.82	10620.00	416.10	433.95
.82	12870.00	416.10	435.85

Figure C.4 Partial Listing of SUMPO Water Surface Profile Data

Importing Water Surface Profile Data from HEC-RAS

After the HEC-RAS River Analysis System program has been executed, program options can be used to create a text file of the water surface profile data for importing into the FDA program. Separate data files are created for each plan and stream. Error messages will be displayed if more than one stream or plan is included in the file you are attempting to import. If this happens, return to the HEC-RAS program and re-generate the file with one stream and/or plan, as needed. Note that river tributaries may be designated only as separate hydraulic reaches in HEC-RAS. When importing these data into the HEC-FDA program, tributaries are generally considered separate streams and water surface profile data should be imported separately for each stream. When the HEC-RAS analysis has been completed, do the following:

- # Select "Profile Table..." from the View Menu on the main HEC-RAS screen.

- # From the Standard Tables drop down menu on the Profile Output Table screen select “HEC-FDA.”
- # From the Options menu, select the appropriate plan, water surface profiles, and reaches to be included in the table. (Remember, HEC-FDA requires eight profiles.) The table cross section order (downstream to upstream or increasing by station) should also be specified. The analyst may also want to save the table with these options by selecting “Save Table” from the Options menu.
- # Once the table is generated (see Figure C.5), check the results to see if it included the eight profiles and the stations for the stream of interest.
- # Save the profile summary table to a text file, select “Write to Text File” from the File drop down menu on the Profile Output Table screen. Specify a file name with an extension of “*.wsp”.

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)
RedFox	.00	3000.00	0.00	6.86
RedFox	.00	4500.00	0.00	8.60
RedFox	.00	6500.00	0.00	10.56
RedFox	.00	9000.00	0.00	12.65
RedFox	.00	10000.00	0.00	15.49
RedFox	.00	11000.00	0.00	15.68
RedFox	.00	12500.00	0.00	15.95
RedFox	.00	15000.00	0.00	16.32
RedFox	.01	3000.00	4.00	10.36
RedFox	.01	4500.00	4.00	12.22
RedFox	.01	6500.00	4.00	14.66
RedFox	.01	9000.00	4.00	17.42
RedFox	.01	10000.00	4.00	15.79
RedFox	.01	11000.00	4.00	15.67
RedFox	.01	12500.00	4.00	16.88
RedFox	.01	15000.00	4.00	17.00

Total flow in cross section.

Figure C.5 HEC-RAS Profile Output Table for HEC-FDA

An example partial listing of a saved text file from HEC-RAS for importing is shown in Figure C.6.

```

Profile Output Table - HEC-FDA
HEC-RAS Plan: RedFox River: RedFox Reach: RedFox

# Rivers          = 1
# Hydraulic Reaches = 1
# River Stations  = 32
# Plans           = 1
# Profiles        = 8

Reach            River Sta      Q Total    Min Ch El    W.S. Elev
                  (cfs)          (ft)        (ft)

RedFox           .00             3000.00     0.00         6.86
RedFox           .00             4500.00     0.00         8.60
RedFox           .00             6500.00     0.00        10.56
RedFox           .00             9000.00     0.00        12.65
RedFox           .00            10000.00     0.00        15.49
RedFox           .00            11000.00     0.00        15.68
RedFox           .00            12500.00     0.00        15.95
RedFox           .00            15000.00     0.00        16.32

RedFox           .01             3000.00     4.00        10.36
RedFox           .01             4500.00     4.00        12.22
RedFox           .01             6500.00     4.00        14.66
RedFox           .01             9000.00     4.00        17.42
RedFox           .01            10000.00     4.00        15.79
RedFox           .01            11000.00     4.00        15.67
RedFox           .01            12500.00     4.00        16.88
RedFox           .01            15000.00     4.00        17.00
    
```

Figure C.6 Partial Listing of File from HEC-RAS Profile Output Table - HEC-FDA