RASPLOT 3.0
Quick Start Guide

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RASPLOT

RASPLOT is a computer program created by the Federal Emergency Management Agency (FEMA), originally developed to allow users to create flood profiles through the automatic extraction of data from Hydraulic Engineering Centers River Analysis System (HEC-RAS) hydraulic modeling files. Flood profiles are required for inclusion in the Flood Insurance Study (FIS) reports which usually accompany the Flood Insurance Rate Map (FIRM) for communities participating in FEMA's National Flood Insurance Program.

RASPLOT Version 3.0 includes upgrades to existing features, correction of known issues and the addition of new features including:

- **A Floodway Data Table (FDT) Creation Tool which allows users to create FIS report FDTs.**

- **A Batch Portable Document Format (PDF) Generation Tool to allow for batch printing.**

- **Functionality to allow for the exchange of data between the program and FIRM database tables.**

- **Compatibility with Windows 8.2 and HEC-RAS 4.2.**

- **Incorporation of the most up-to-date domain tables from the November 2014 issuance of the FIRM Database Technical Reference.**

- **Addition of the 1% Plus flood profile.**

- **Standardized footnote creation.**

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System Requirements

The following system hardware requirements apply in order for RASPLOT 3.0 to be fully functional:

- 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit).

- 16 GB available hard disk space (32-bit) or 20 GB (64-bit) Video Graphics Array (VGA) or above display type.

- Printer capable of printing 11"x17" sheets in black and white (in order to print profiles to scale).

The following software requirements apply in order for RASPLOT 3.0 to be fully functional:

- A Windows 7 or 8 operating system must be installed on the computer.

- The U.S. Army Corps of Engineers' HEC-RAS program, version 4.1 or 4.2 must be installed on the computer.

- Adobe Reader or equivalent must be installed for viewing PDF files.

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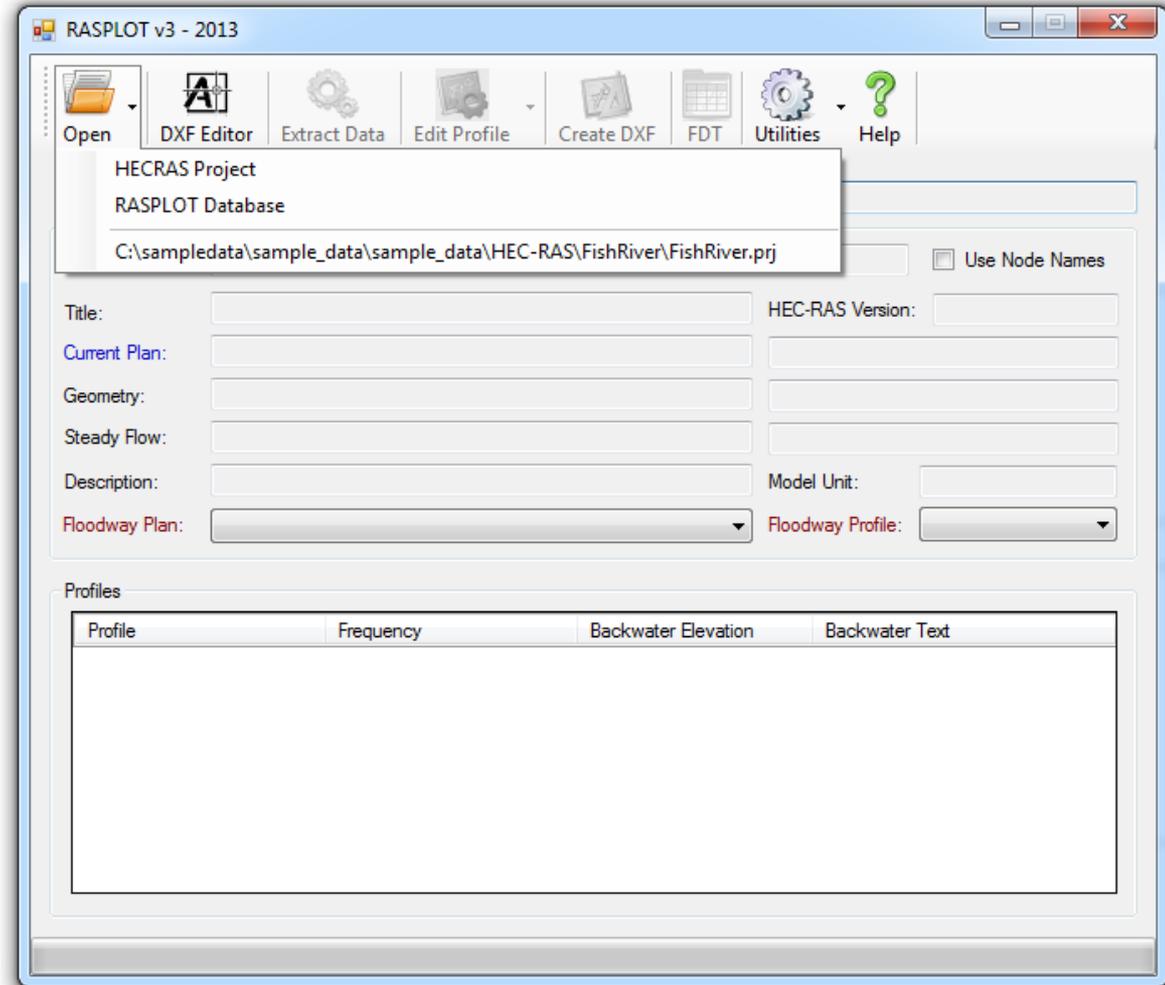Increasing Resilience Together

Installation and Program Setup

- After insuring your computer meets the system and software requirements noted above, double click on the RASPLOT 3.0 Setup.exe file and follow the directions on the screen to install the program. Administrative privileges will be needed in order to perform this operation. The default installation location is: C:\Program Files (x86)\FEMA\RASPLOT v3.0.

- *If a previous version of RASPLOT (Version 2.5 or lower) is installed on your computer, it does not need to be uninstalled prior to installing RASPLOT 3.0.*

- After installation, RASPLOT can be accessed by navigating to the Windows Start menu and clicking on the *RASPLOT v3.0* shortcut in the list of programs.

- RASPLOT 3.0 will assume the program (.exe) file for HEC-RAS 4.1.0 is installed at the following location:

    C:\Program Files (x86)\HEC\HEC-RAS\4.1.0

If HEC-RAS 4.1 is installed at another location on your computer, you will need to specify it by navigating to *Utilities/Setup HEC-RAS* in RASPLOT and specifying the installation location before you can use the program.
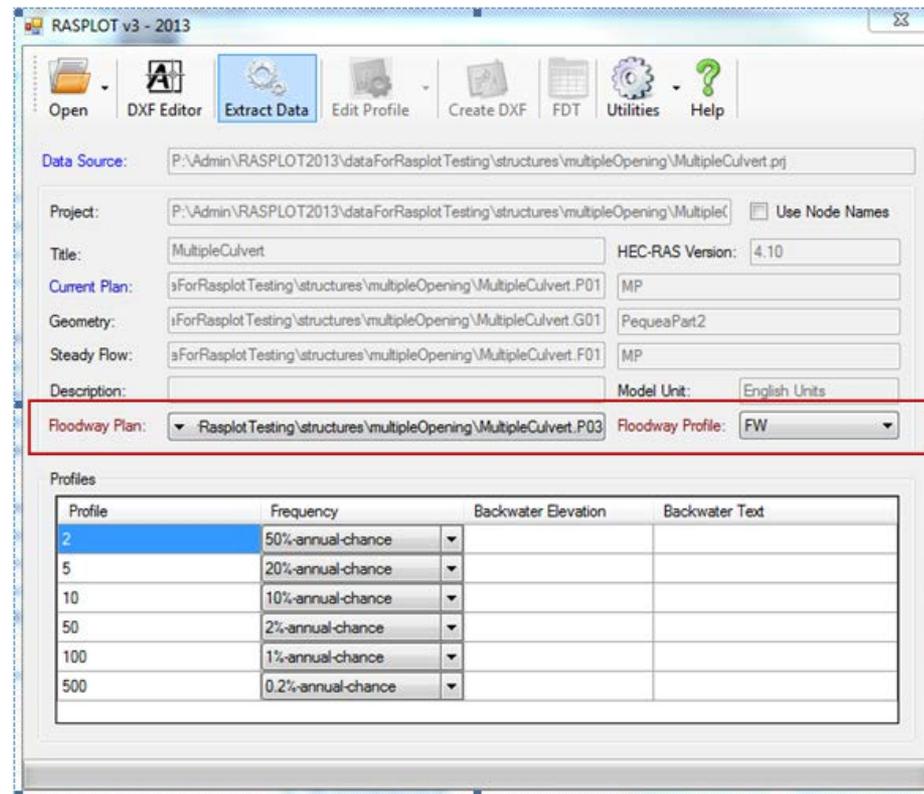
Opening Files and Adding Data

- After opening the program, click on the 'Open' button drop down arrow. You will see a menu with 2 options: HEC-RAS Project and RASPLOT Database. Previous files which you have accessed by will be shown below the two options.

- To create flood profiles or FDTs from an existing HEC-RAS project file, click on 'HEC-RAS Project' and navigate to the desired HEC-RAS .prj file to open the file.

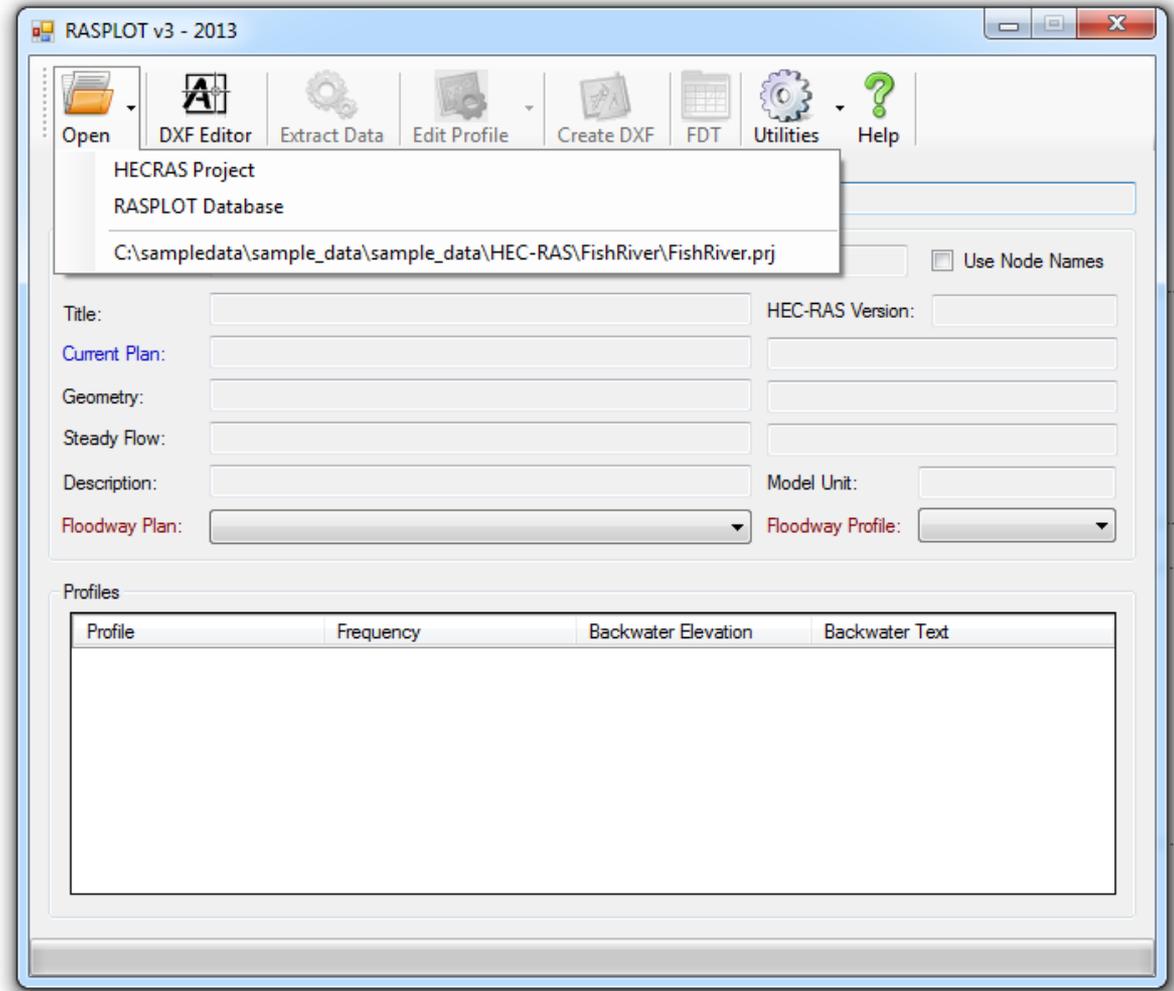- **Note: RASPLOT does not support unsteady flow models!**

Opening Files and Adding Data: Floodways

- The FDT Creation Tool in RASPLOT has been set-up to expect that the Floodway Plan has two profiles included, the 1st being the 100-year flood profile and the 2nd being the floodway profile. This is in accordance with guidance provided in Chapter 6 of the HEC-RAS v4.1 Applications Guide (January 2010).

- When applicable, RASPLOT will show encroached plans in the Floodway Plan drop down menu. If there is more than one encroached plan, you will need to select the correct floodway plan and the name of the encroached profile in the Floodway Profile dropdown list.

- In cases where 2 separate HEC-RAS projects have been prepared, with one containing the multiple profile analysis and the other containing the floodway analysis, you will need to combine both plans into one HEC-RAS project. In cases where one HEC-RAS project has been prepared and where all recurrence intervals and the floodway have been included in one plan within the project, the user will need to create a separate plan within the project for the floodway.
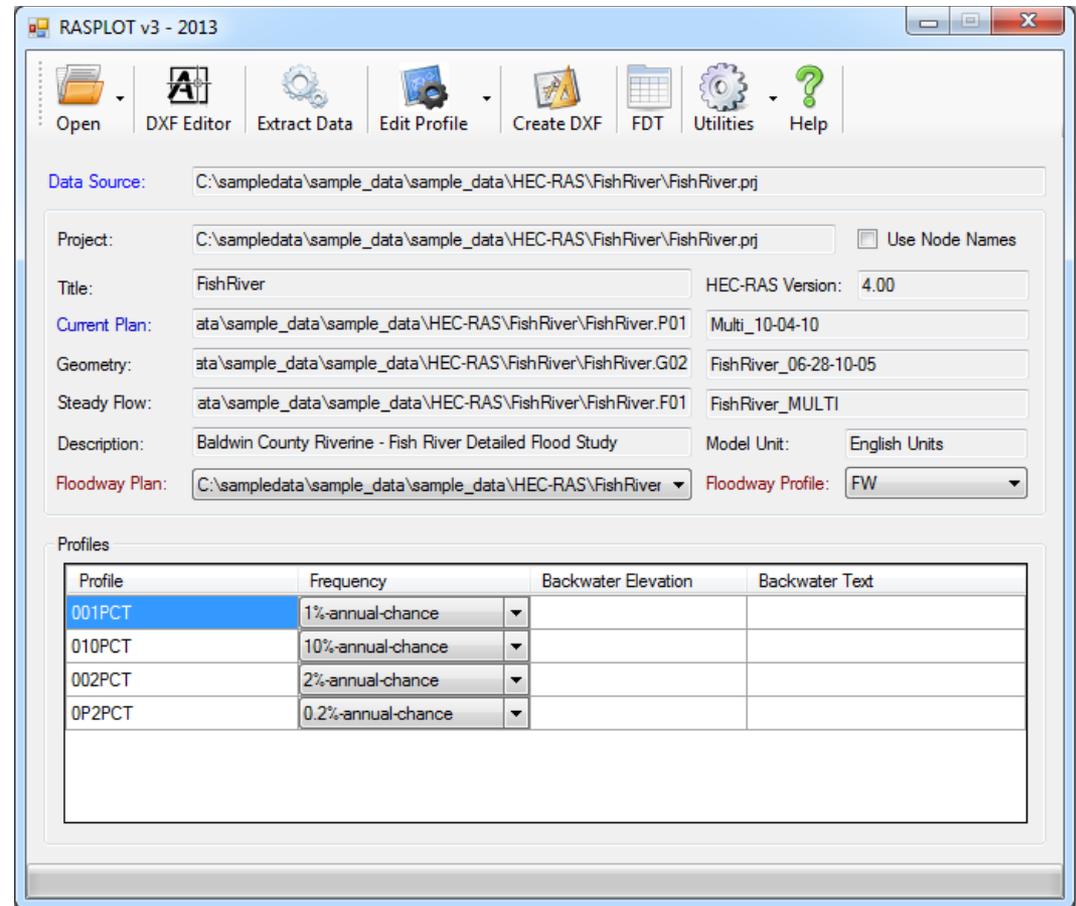
Opening Existing RASPLOT Databases

- You may also open a previously created RASPLOT database by clicking on the 'RASPLOT Database' menu item.

- **Note: the RASPLOT database must be in the RASPLOT 3.0 database schema.**

- If the RASPLOT database was created using an older version of RASPLOT, you will need to first convert the database to the new schema using the 'Convert Old RASPLOT Database' option under the Utilities menu (See Section 4.3 of the User Guide).
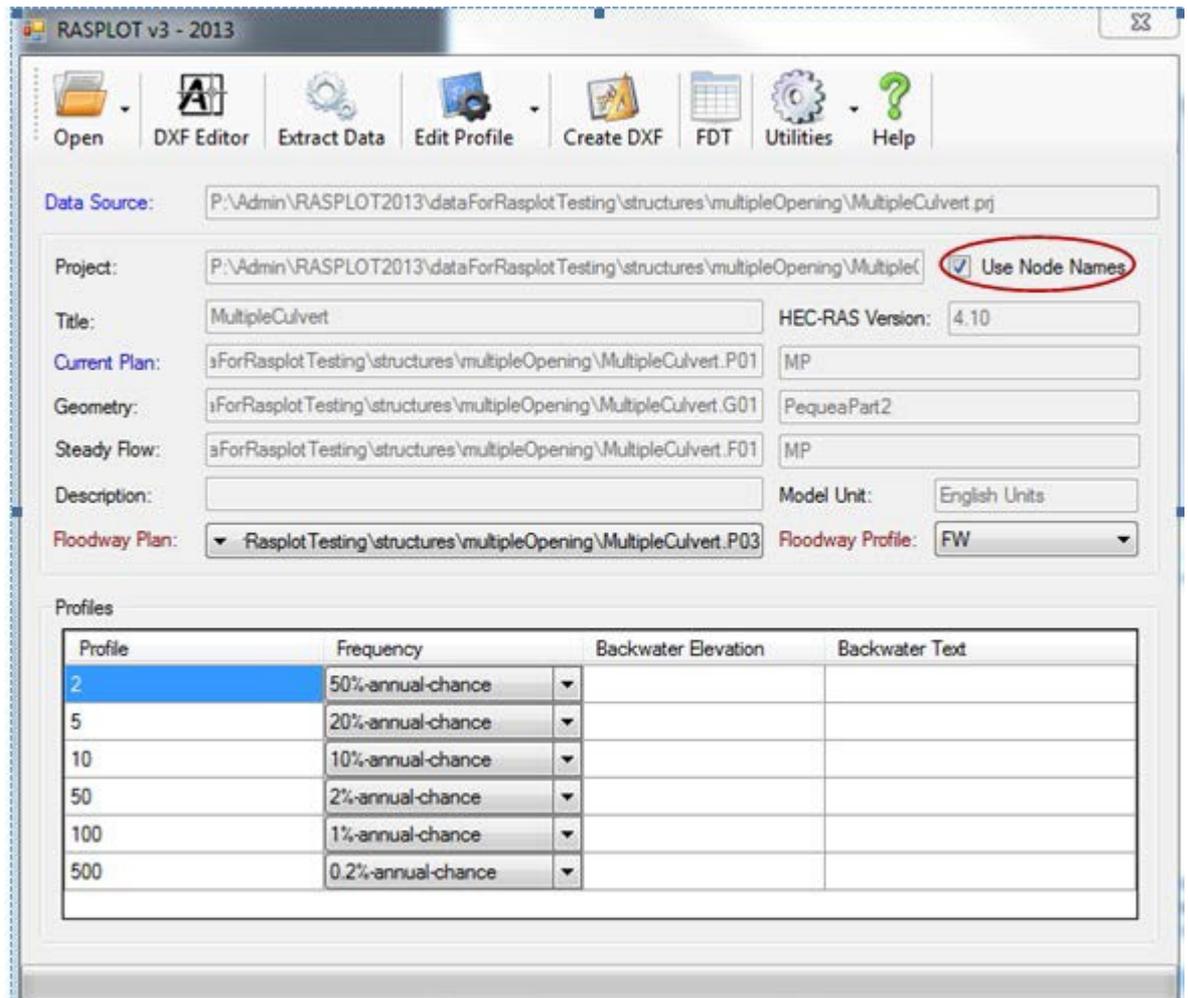
Selecting Profiles

- The Profiles window on the main interface screen will show the name and description of the profile from the HEC-RAS model in the field 'Profile'. RASPLOT attempts to determine the correct corresponding frequency for each modeled profile. However, you should verify the frequencies are correct before proceeding to extract the data. RASPLOT tabulates the elevations of profiles and plots the profiles under the name of the Frequency selected.

- Currently RASPLOT has the 1%, 1% plus, 0.2%, 2%, 4%, 10%, 20%, 50%, and 1% future conditions annual chance flood events included in the Frequency drop down list by default. Any other modeled frequency that needs elevations to be extracted and plotted can be added by using the Flood Frequency option on the Utilities tab (See Section 4.6 of the User Guide).

Using Node Names

- When the 'Use Node Names' box is checked on the main interface screen, RASPLOT will populate the node names attributed to the cross sections in the HEC-RAS model as cross section 'letters' in the RASPLOT database, which will be carried over into the flood profiles and FDT generated by the program (See Sections 6 and 8 of the User Guide).
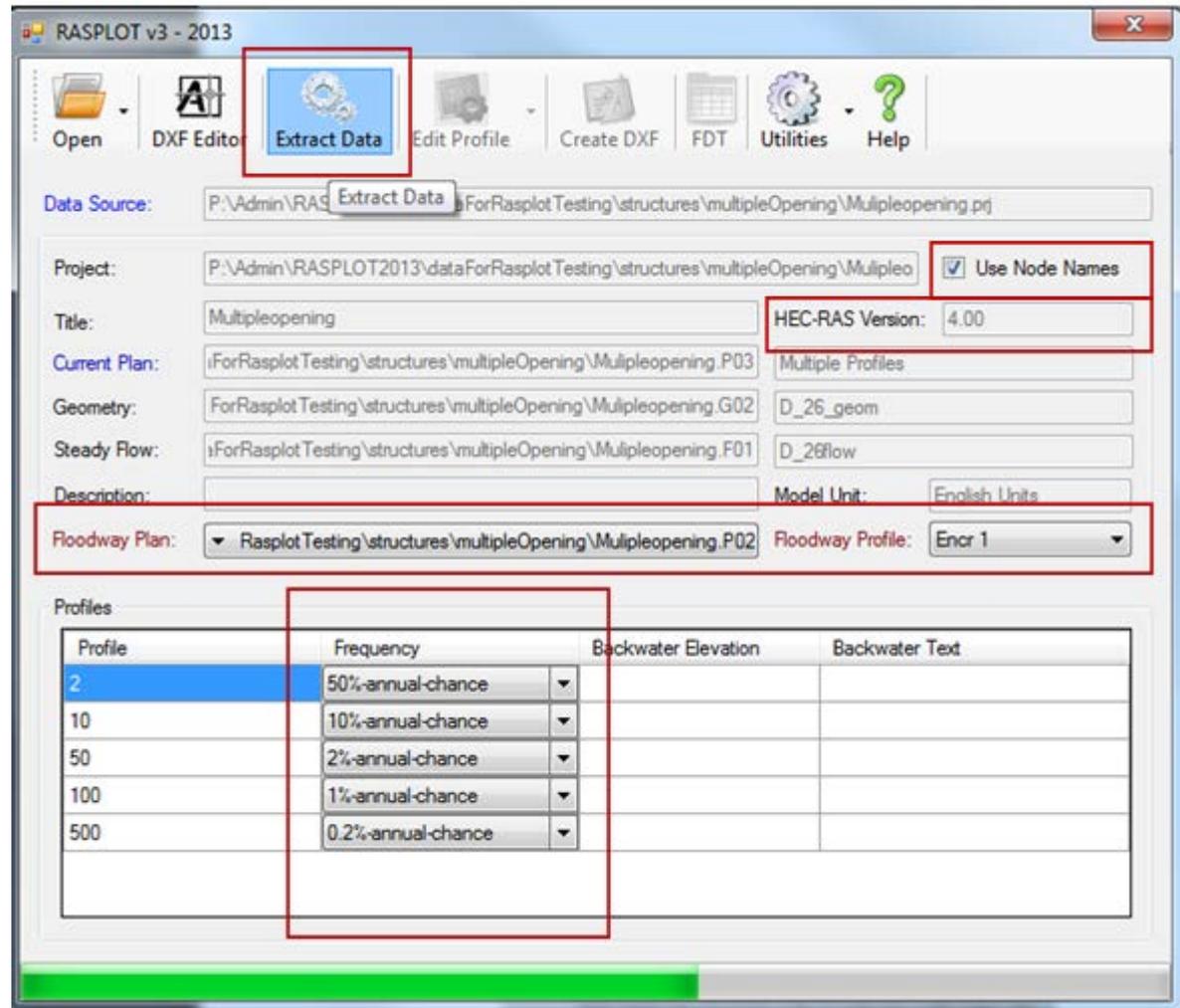
Extracting Data from HEC-RAS

- After opening your HEC-RAS model in RASPLOT, setting/verifying the frequencies of each of your profiles, and selecting the appropriate Floodway Plan and Floodway Profile (See Section 4 of the User Guide), you will be ready to extract the HEC-RAS data into a RASPLOT Database.

- To extract the data, simply click on the Extract Data button at the top of the interface screen. A dialogue box will appear which will allow you to choose the location and name for the RASPLOT database which will be generated.

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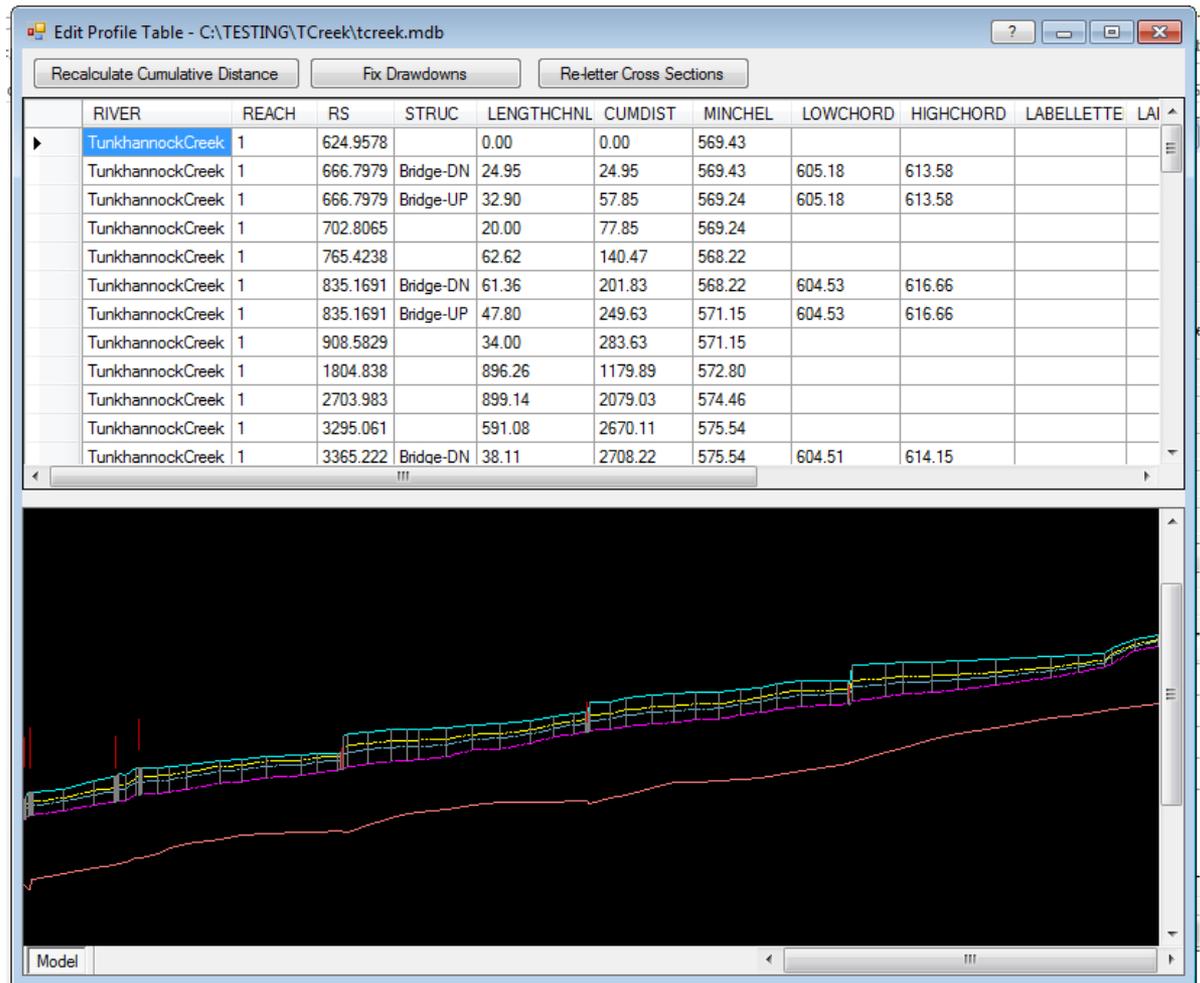Increasing Resilience Together

Adding Backwater Information

- After data has been extracted, backwater elevations and text can be added to the profile plots. From the 'Profiles' section on the main interface screen, you can provide backwater elevations to the corresponding Frequency at the column labeled 'Backwater Elevation.' The backwater elevation entered for each profile must be higher than the lowest elevation associated with that profile based on the data extracted from the HEC-RAS model.

- Also, in the 'Backwater Text' column you can provide a backwater note that will be displayed along with a backwater indicator line on the DXF profile panel plot generated by the program.

Profiles

Profile	Frequency	Backwater Elevation	Backwater Text
10-year	10%-annual-chance	8.5	
50-year	2%-annual-chance	10.3	
100-year	1%-annual-chance	11.9	1% ANNUALCHANCE BACKWAT...
500-year	0.2%-annual-chance	12.4	

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Edit Profile Window

- Under 'Edit Profile', select 'Edit Profile Table'. A window will appear showing the RASPLOT database and a rough plot of the profile.

- To add lettered cross sections to your flood profile, enter the desired letter at the desired river station in the 'LABELLETTER' field in the table.

- Text can be entered in the 'LABEL TEXT' field that will appear on the flood profile, including text for structures, corporate limits, confluence points, etc.

- You can also automatically recompute cumulative distance and fix drawdowns through this window using the buttons at the top left side of the screen. (See Section 6.2 of the User Guide).
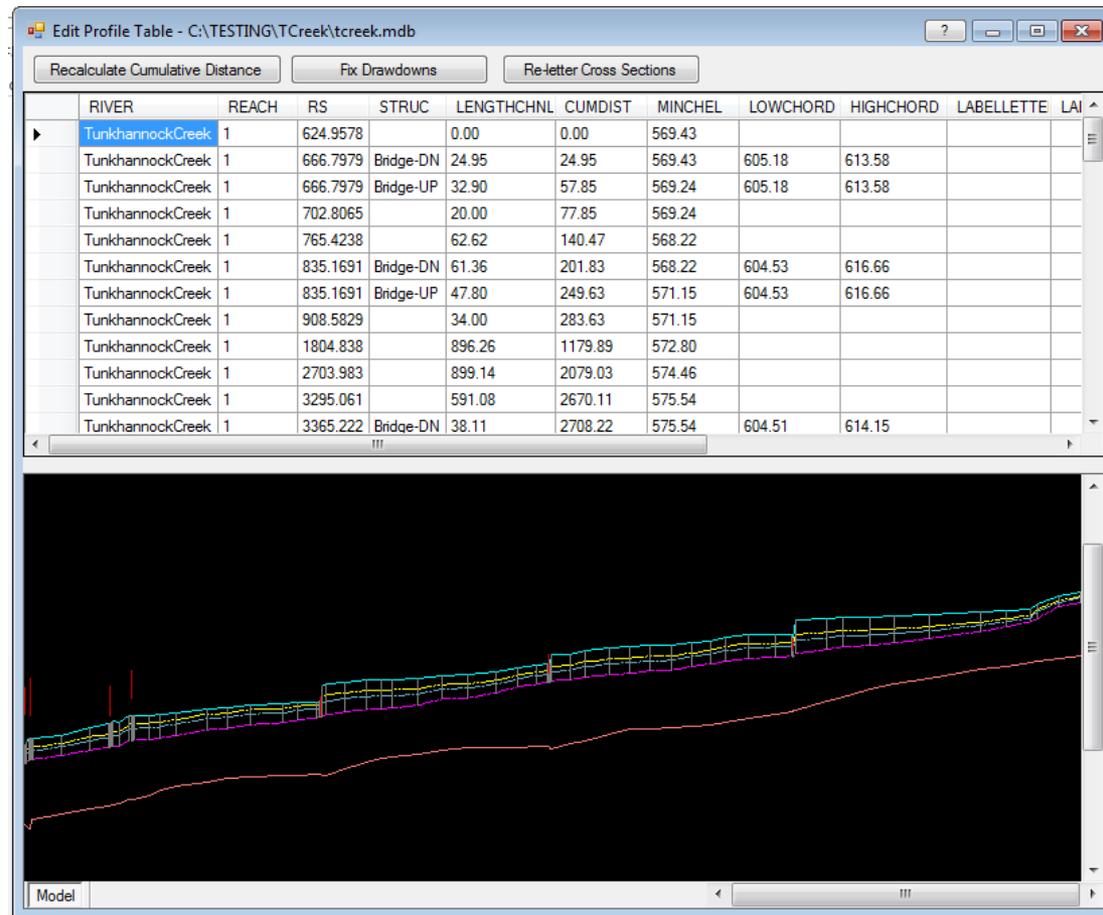
Edit Profile Window, cont.

The Profile Plot Window shows an overview of the profile of the stream and its panel(s).

- When you click the left hand gray cell for a particular river station row in the profile table, the location will be highlighted in yellow in the profile plot window.
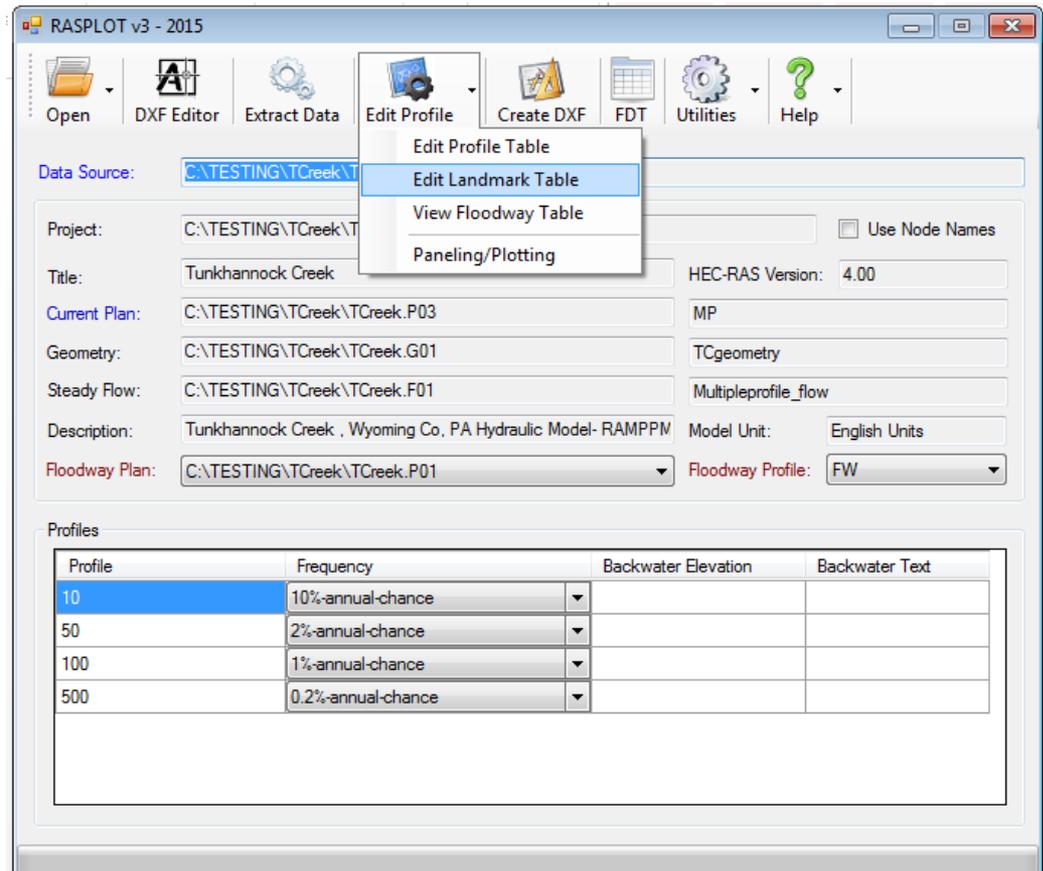
To Navigate:

- While the mouse cursor is within the Plot Window, you can right click using the mouse to bring up viewing options, then left click to use these options:

  - Zoom In
  - Zoom Out
  - Full Extent
  - Pan

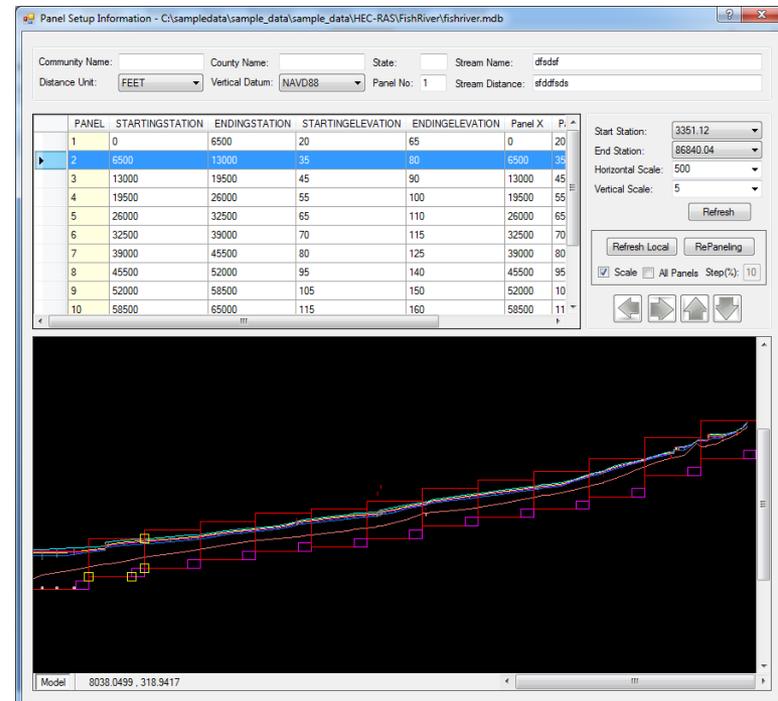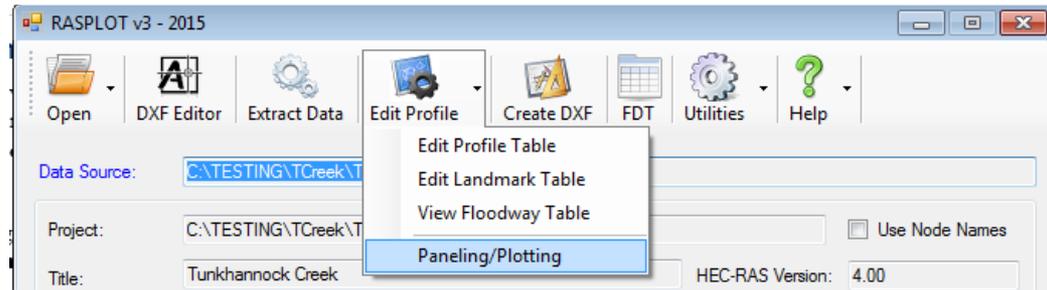- Dynamically zoom using the middle scroll button on the mouse.

Edit Landmark Table

- The 'Edit Landmark Table' window allows you to insert horizontal or vertical notes at any point on the profile. This is not limited to cross section locations. To access this window, click the Edit Profile drop down menu and click 'Edit Landmark Table.'

- For instructions on how to use this functionality, please refer to Section 6.3 of the User Guide.
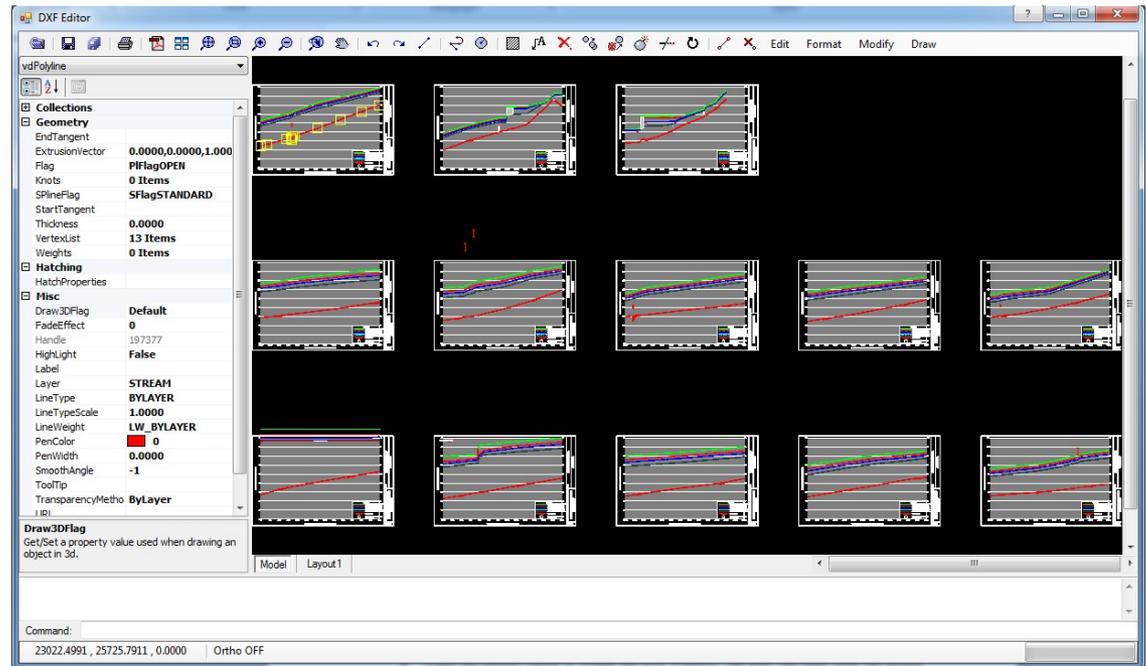
Paneling/Plotting Window

- The Paneling/Plotting window allows you to view and edit profile panel information which then will be used to generate the DXF profile(s).

- To access the Paneling/Plotting window from the Edit Profile icon, click the drop down menu and then click on 'Paneling/Plotting.'

- Includes improved ways to configure panels. See Section 6.5 of the User Guide for more information.
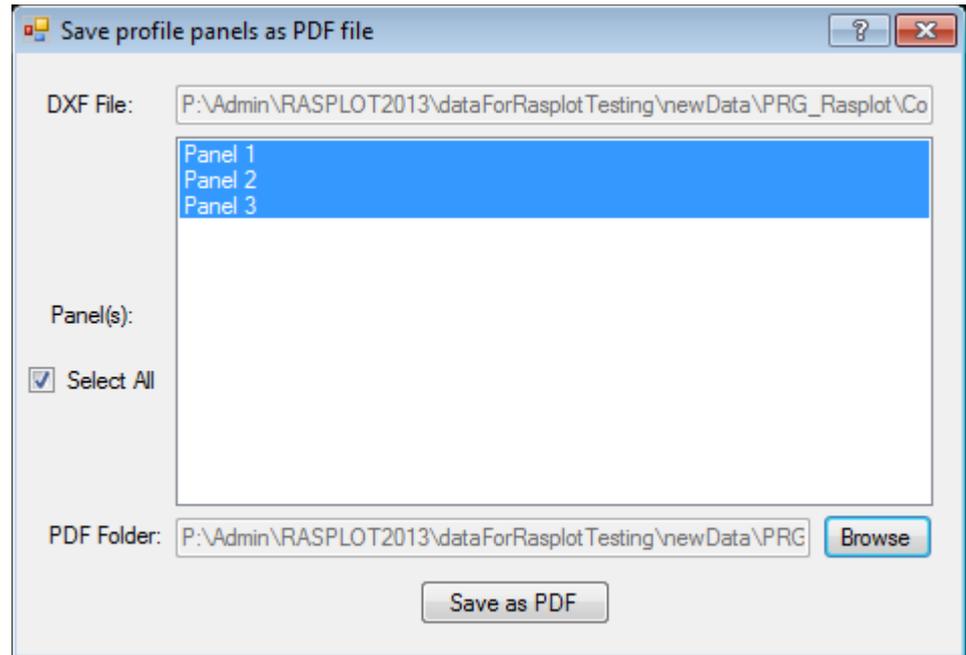
DXF Editor

- The DXF editor allows you to view, modify and print DXF files after creating a DXF file from the RASPLOT database using the Create DXF button. It is a fully functional CAD program where you can create, erase, trim, explode, rotate, copy, move and format objects.

- RASPLOT 3.0's DXF Editor has improved editing tools and an updated look.

- See Section 7.2 of the User Guide for more information.

Exporting DXF Profiles

- To save multiple profiles from the same DXF file as a multiple page PDF file, click the 'Batch Save as PDF' button in the DXF Editor.

- You have the option to select which panels they would like to include in the PDF file by clicking any panel listed in the Panel(s) display box. You can check the 'Select All' box to include all of the panels. You then need to click the Browse button to navigate to where you would like to save the PDF and enter a file name.

- Then click the 'Save as PDF' button.

FDT Creation Tool

- After a RASPLOT database has been created or loaded, the 'FDT' button on the main interface screen will become active. Keep in mind that in order to use the FDT Creation Tool, the RASPLOT database must have lettered Cross Sections (see Section 6.2 of the User Guide) and a floodway table (Section 6.4) populated.

- To create an FDT, first you must load a valid RASPLOT database if not already done.

- Then click the FDT button.

- The FDT Creation Tool window will then appear.

- If you have already entered community, state, and stream name information for use on flood profiles associated with the same model in the Paneling/Plotting window (See Section 6.5 of the User Guide), this information will be auto-populated in the General Info section. Otherwise, you will have to fill out all of the fields in this section.
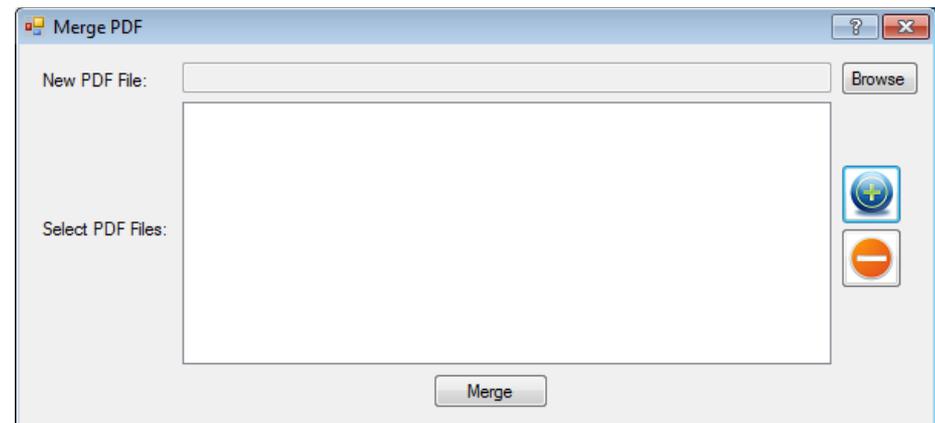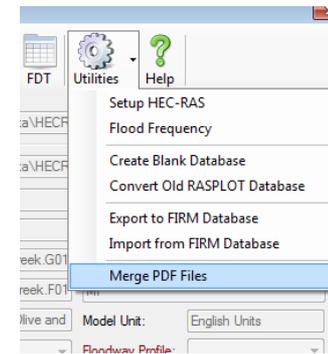
FDT Creation Tool, cont.

- The Note Number/Note Text section in the top center of the FDT Creation Tool screen allows you to select standard FDT footnotes for inclusion in the FDT. You can select the desired footnote(s) from the dropdown list and include up to four footnotes on the FDT.
- For footnotes that include bracketed text, the FDT generated will need to be manually updated by the user to add the text indicated in the brackets.
- You may also create your own customized footnote by selecting the blank row above the first footnote in the dropdown list. Then the desired text can be typed in the Note Text field to the right of the Note Number.
- You can associate a particular footnote to a particular column in the FDT by entering the applicable Note Number in the Field Name/Note Number box on the right.
- You also have the option to add a note for specific data field on the FDT. In the Floodway section each column field has a 'Note' column next to it. Enter the note number next to the desired record to add this note for a specific data field.
- When done with inputs, click the Generate FDT button at the bottom of the window to export as a PDF or Word document.

Note Number	Note Text	
1	Feet above mouth	▼
2	Feet above confluence with [Enter flooding source name]	▼
3		▼
4		▼

Without Floodway	Note	
7	3	7
1050.702	3	1
1061.452		1
1089.854		1
1136.046		1

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Merging Multiple PDF Profile or FDT Sets

- Once sets of profiles or FDTs for different streams have been exported as PDF files, you can consolidate the PDF files into one file. RASPLOT allows you to perform this merge using the 'Merge PDF Files' option under the Utilities menu.

- From the main interface window, click the Utilities drop down menu and select 'Merge PDF Files.'

- The Merge PDF dialog window appears.

- You must first create a New PDF file by clicking the Browse button.

- Next, add the PDF files to merge by clicking the Add button (Plus sign).

- This opens up the Open dialog window. Navigate to where the PDF files are and select all of the desired files. Then click the 'Open' button.

- You can select the PDF, then drag to the top of the list to change the order of how the PDFs will be merged.

- To merge, click the Merge button.

Export to FIRM Database-Compatible Format

- Once you have created a RASPLOT database, flood profiles and/or FDTs using RASPLOT 3.0, you can choose the Export to FIRM Database function to export the information in the RASPLOT database into database tables which reflect the schema referenced in the November 2014 FIRM Database Technical Reference.

- From the Utilities menu, choose 'Export to FIRM Database.' The Export to FIRM dialog box will appear.

- Next, click either the 'Shapefile' or 'PGDB' button at the top right of the box. If you have chosen the PGDB (Personal Geodatabase) option, you will need to navigate to your desired location where your new FIRM Database-compatible file(s) will be located and choose a name. Afterwards, click 'Save.' This will save a blank database in the FIRM Database schema, containing only the tables that RASPLOT will export, and that conforms to the November 2014 FIRM Database Technical Reference. If you have chosen the Shapefile option, you can browse to a location where the output Shapefiles will be stored. You may want to create an empty folder for your Shapefiles before you export your data.

- Next, browse to the RASPLOT database(s) from which you want to export data by clicking the plus sign to the right. Note that you can choose multiple RASPLOT databases to export into a single FIRM Database. When done, click 'Export.'

- RASPLOT does not export spatial features. You will either need to create spatial features in your FIRM Database or join the exported RASPLOT data to pre-existing spatial features in your FIRM Database using the cross section's stream name and stream station.

- For more information, see Section 10 of the User Guide.

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Import from FIRM Database

- You can choose to import data from a FIRM database into RASPLOT in order to use RASPLOT 3.0 to create flood profiles and FDTs. Note that the FIRM Database must conform to the schema provided in the November 2014 FIRM Database Technical Reference and it must be either in Shapefile format or a personal geodatabase, not a file geodatabase.

- Browse to the folder where you want to store the RASPLOT database that will be populated with the FIRM Database data and provide a file name. Browse to the FIRM Database you want to import data from and choose the stream name of the data you want to import. Click 'Import to RASPLOT.'
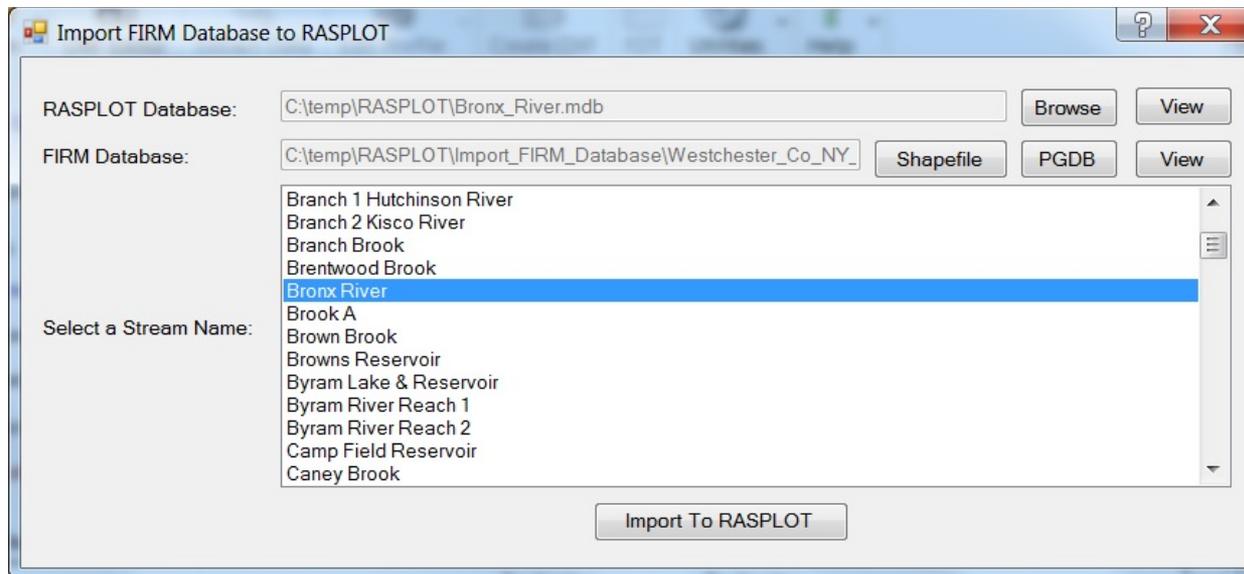
Import from FIRM Database

- Once the data have been imported, you can preview the RASPLOT Database tables that are created by choosing the 'View' button. Choose the table name to view from the drop down box at the top.

- Using the imported RASPLOT database, you can create FDTs or flood profiles. Note that for data imported from a FIRM Database you should not recalculate the cumulative distance to be the river station (RS) in the Edit Profile Table window (See Section 6.2 of the User Guide). If you do, your distances may be incorrect.

- Note also that your FIRM Database must have streambed elevations in order for RASPLOT to be able to generate a profile.

- For more information, see Section 11 of the User Guide.

For More Information

- **For more detailed information on all RASPLOT 3.0 functionality, please refer to the RASPLOT 3.0 User Guide available directly in the program 'Help' function.**
- **You may also visit the RASPLOT 3.0 fema.gov page to learn more.**

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