

Cross Section Tool

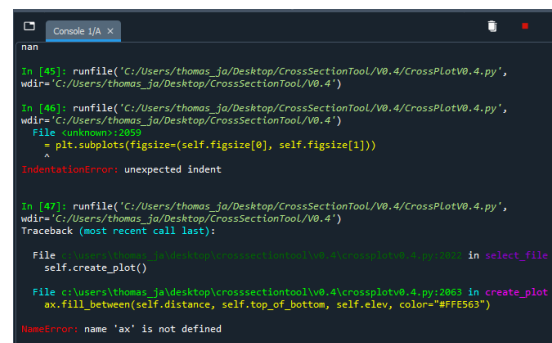
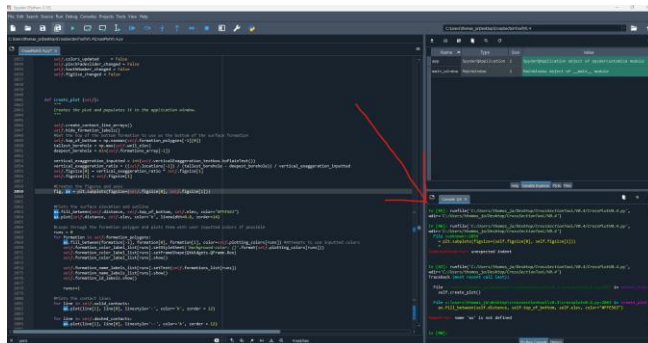
QuickStart Guide

Note: The QuickStart guide assumes you have an excel file that follows the guidelines required to plot as a cross section.

- 1) Open Anaconda Navigator and launch Spyder.
- 2) Once Spyder is running make sure you are running the most recent version of the Cross Section Tool. **(The current version is shown in the top left corner of the program and should match the most recent email update from Joshua Thomas)**
- 3) Click the play icon or “Run” at the top left of the spyder application. **(You will see an icon appear at the bottom of your screen in the hotbar.)**
- 4) Now the program is open, click select file and navigate to your excel sheet.
- 5) Once you have your excel sheet selected you should be able to see your cross section in the drawing space.

Errors and Expectations

If ANYTHING does not work the way you expect or just doesn't work at all. Please email me the excel file you used and a short description of what you did that lead to the issue. If you want, you can include a screenshot of the console from Spyder like the one below on the right. If you want a feature added ask me to do so. Don't worry about if its possible, that's for me to figure out, just dream it up and I will do my best.



Main Page

The main page is intended for editing basic features and viewing the cross section image you create.

Select File

Opens a file explorer where you can select the data sheet for the cross section.

Update Figure

Refreshes the cross section drawing to reflect any change you have made. This button is included on every page for convenience.

Open Second Window

Second window is opened by default, but this button will open it in the case that you close it.

Adjust Pinch / Fade Locations

This section is meant to be used in the editing of pinch and fade location between two boreholes. By default, they are plotted in the middle of the two boreholes.

Pinch / Fade

Select which style you would like to edit, pinch or fade.

Formation

Select the formation containing the style you would like to edit.

Selection and direction

Select the specific borehole you would like to edit, and the direction of the style being edited. A W# will appear with a left or right direction as an option if there is one.

Slider

Once the style to be edited is selected the slider will populate with the left side being the distance along the cross section of the left borehole and the right side being the distance along the cross section of the right borehole.

Fade Teeth

When editing a fade, an extra selection to change the number of teeth will appear. You may type any number into this box.

Change Plot Size

Handling plot size with many different screen pixel sizes is difficult, so to allow the user to adjust the plot for their screen I have included buttons to increase or decrease the plot size.

Vertical Exaggeration

The vertical exaggeration can be typed into this box as an integer number. By default, it is set to 100.

Formation Colors

On the right side of the page squares with the name and color of each formation are shown. These are shown to make it easier for the user to make edits without referencing their initial data sheet.

Formations Page

Update Figure

Refreshes the cross section drawing to reflect any change you have made. This button is included on every page for convenience.

Top Depth of Formations

This table shows the tops of each formation with each row representing a formation and each column representing a borehole. The last row represents the distance along the cross section that borehole is at.

This table is in mean sea level values automatically calculated from the excel sheet provided.

Any changes made to this table should be reflected in the cross section. It is not recommended to change the distance values of a borehole in this table.

Formation Polygons

To plot the formations in python, polygons must be calculated, these polygons consist of 3 rows. The first row is the top of formation, second row is bottom of formation and the last row is the distance along the cross section.

Any changes made to this table should be reflected in the cross section. It is not recommended to change the distance values of a borehole in this table.

Note: The columns do not all correspond to a borehole, fade and pinch styles require extra point along the polygon. Also, note that the bottom of formations often intersects with the formation below, this is to make sure that formations do not leave gaps when plotted.

Style Page

Formation Style

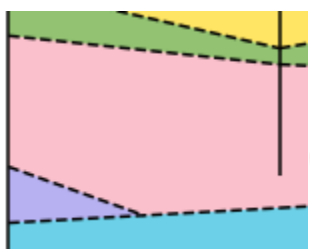
This is one of the most important and possibly most confusing parts of the program. This is how the program knows what kind of shapes to make and where there are null values.

n is placed on a cell where there is no value

x is placed on a cell where there is a value

p is placed on a cell, instead of an x, where a pinch is wanted. The direction of a pinch is automatically calculated according to the n's around it.

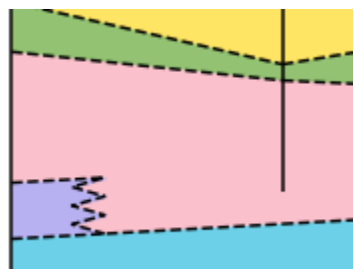
Below is an example of a pinch and the table corresponding to it. You can see that because the borehole to the right has no value the pinch goes to the right.



	W-872	W-4412
Tquc	n	n
Tqsu	n	n
Thp	x	x
Tha	x	x
Ts	p	n
To	x	c

f is placed on a cell, instead of an x, where a fade is wanted. The direction of a fade is automatically calculated according to the n's around it.

Below is an example of the same borehole but styled as a fade instead of a pinch.

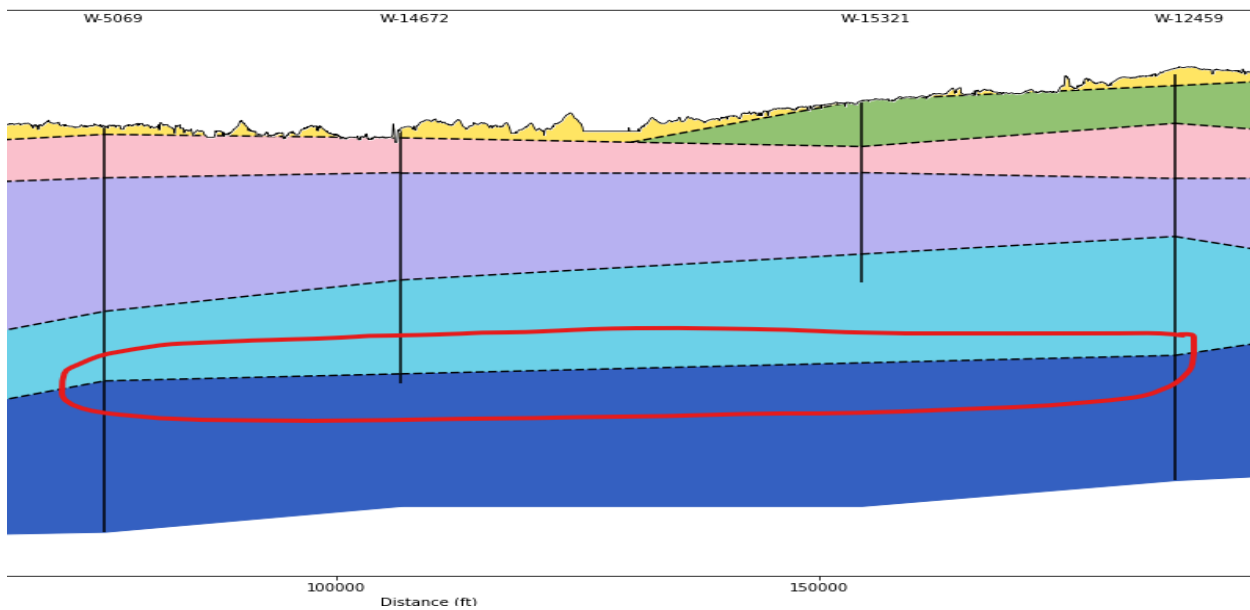


	W-872	W-4412
Tquc	n	n
Tqsu	n	n
Thp	x	x
Tha	x	x
Ts	f	n
To	x	c

c is placed on a cell, instead of an n, where you want the program to connect over a gap. Multiple c's can be used to connect over a multi-borehole gap.

The example below shows how the connection style is used. Replacing what would have been nulls values or n's with c's to connect across multiple boreholes. This creates a straight line across the gap with points at each boreholes location along the cross section to allow the user more customization.

	W-4506	W-6232	W-14004	W-11805	W-5069	W-14672	W-15321	W-12459	W-15342	W-6863
Thp	n	n	n	n	n	n	p	x	x	x
Tha	x	x	x	x	x	x	x	x	x	x
Ts	x	x	x	x	x	x	x	x	x	x
To	x	x	x	x	x	x	c	x	x	x
Tap	x	x	x	c	x	c	c	x	x	x
TD	x	x	x	x	x	x	x	x	x	x



Sample Type

This table is for the plotting of dashed and solid contact lines. CUTTINGS and CORE are the only two options. CUTTINGS will plot a dashed line halfway to a CORE borehole or follow a pinch/fade originating at that borehole. CORE will do the same but with solid lines. If two boreholes are the same sample type this will be plotted as a continuous line between the two.

Formation Colors

If formation names have been entered correctly into the headers for each column of the excel sheet then the formation colors should be selected automatically. If another color is wanted for a formation, then this table allows hex colors to be inputted to change the color for any single formation.

Saving / Exporting

Saving a Cross Section

To save your cross section figure, click on “Cross Section” in the top left of the program. Then click save and select the format you want to save as. This will open a file explorer to select the save location of your cross section.

Note: All formats other than DXF use matplotlib to save the figure. These will look the same as the figure in the Cross Section Tool since the plot in the tool is a matplotlib plot. DXF files require a different library called ezdxf which the Cross Section Tool plots separately when you save the cross section as a DXF. If you want to know more about the differences feel free to reach out.

Exporting Plotting Data

When you make changes to a Cross section in the Cross Section Tool, the final product will look different to when you inputted your original data. We want to be able to capture these changes and so you can export the current data as an excel or csv.

Click on “Export Data” in the top left corner of the Cross Section Tool and select your preferred file type, this will open a file explorer menu to select the save location of your file.

Excel Table Format

1. You need an excel file with two sheets with the following names exactly.



2. The Elev sheet must have two columns with the following names. Feel free to copy paste these.

LiDAR_Elev

ACTUAL_DISTANCE

3. You can then put in your surface elevations and their distances along the cross section into that sheet.

G	H
LiDAR_Elev	ACTUAL_DISTANCE
48.52217	0
48.78347	50
48.9808	100
48.97503	150
49.15717	200
49.2662	250
49.21737	300
49.2612	350
49.39835	400
49.5745	450

4. Now to set up the Xsecs sheet you need to have four columns with the following names.

DIST_FT

W_NUM

DEM_ELEV

FORM_START

A	B	C	D
DIST_FT	W_NUM	DEM_ELEV	FORM_START
0	10017	15	
1040	9991	16	
1965	10066	15	
3065	10033	15	
4085	10027	15	
5345	15152	15	
17175	10042	15	

- Leave FORM_START blank, DEM_ELEV is the elevation at the borehole.
- Continue with your formation columns like the picture below. Make sure to add BTM with the TD for each borehole

E	F	G	H	I	J
TQSU	Tt	Thp	Tha	BTM	STYLE_START
0	40	180	425	500	
0	25	175	410	500	
0	35	180	425	500	
0	85	190	440	500	
0	80	160	420	500	
0		90	480	500	
0	90	170	410	500	

- Leave STYLE_START blank
- Create a style column for each formation

K	L	M	N	O	P
TQSU_style	Tt_style	Thp_style	Tha_style	BTM_style	CORE_OR_CUTTINGS
x x		x	x	x	CUTTINGS
x x		x	x	x	CUTTINGS
x x		x	x	x	CUTTINGS
x x		x	x	x	CUTTINGS
x p		x	x	x	CUTTINGS
x n		x	x	x	CUTTINGS
x p		x	x	x	CUTTINGS

- x means there is a value, p means pinch, f means fade, c means connect and n means no value.
- Fill the CORE_OR_CUTTING column with CORE or CUTTINGS. It doesn't do anything right now, but will in the future.

That's it

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	DIST_FT	W_NUM	DEM_ELEV	FORM_START	TQSU	Tt	Thp	Tha	BTM	STYLE_START	TQSU_style	Tt_style	Thp_style	Tha_style	BTM_style	CORE_OR_CUTTINGS
2	0	10017	15		0	40	180	425	500		x	x	x	x	x	CUTTINGS
3	1040	9991	16		0	25	175	410	500		x	x	x	x	x	CUTTINGS
4	1965	10066	15		0	35	180	425	500		x	x	x	x	x	CUTTINGS
5	3065	10033	15		0	85	190	440	500		x	x	x	x	x	CUTTINGS
6	4085	10027	15		0	80	160	420	500		x	p	x	x	x	CUTTINGS
7	5345	15152	15		0		90	480	500		x	n	x	x	x	CUTTINGS
8	17175	10042	15		0	90	170	410	500		x	p	x	x	x	CUTTINGS

If you have a format you want the program to accept let me know and I can try to work it in. I can also make changes to the current format. This was an arbitrary decision and whatever is easiest for people to use is the best.