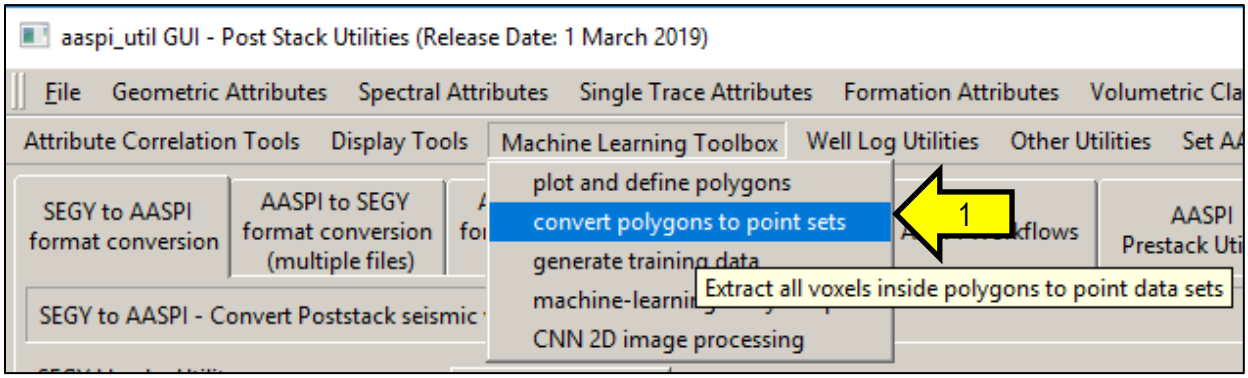
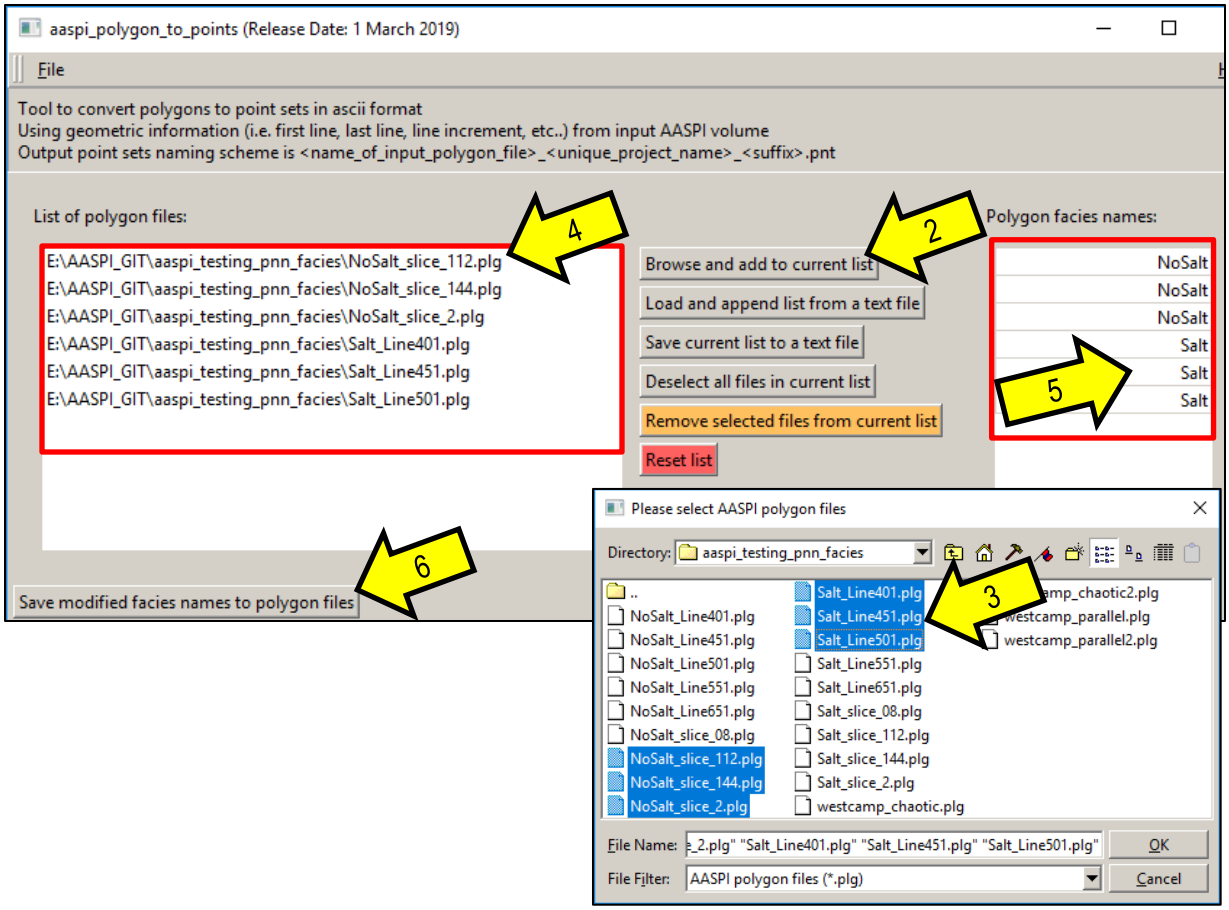
MACHINE LEARNING TOOLBOX: CONVERTING VOXELS INSIDE POLYGONS TO POINTS – PROGRAM polygon_to_points

Contents

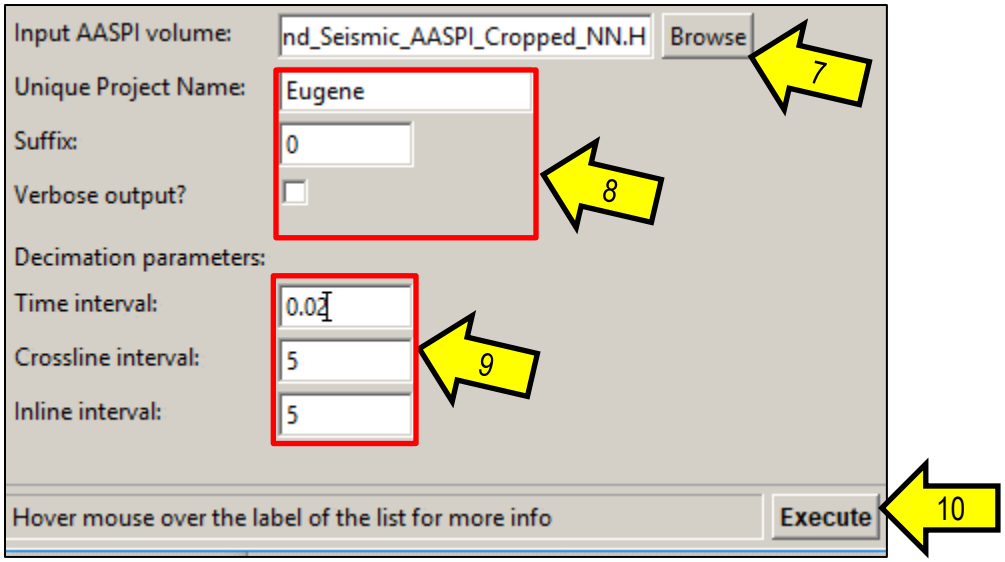
Running aaspi_polygon_to_points

In supervised machine learning workflow, after you defined different polygons for different facies of interest in **aaspi_plot**, the next step is to convert those polygons to point sets. Each point in a point set is defined by inline, crossline, and time/depth. To convert polygons to point sets, go to *Machine Learning Toolbox* menu → *convert polygons to point sets* (1).





Click "*Browse and add to current list*" (2) to select which polygons you want to convert to points (3) and hit OK. The list of input polygon files (4) will be updated, and associated facies names (5) will be automatically loaded from input polygon files. If for some reason, you need to change facies name, double click on the facies name table and start typing. The changes of facies names will be automatically saved when you execute this program. However if you want to save the polygon's facies name right away, you can click on "*Save modified facies names to polygon files*" (6).



Next, browse to the AASPI volume that you used for picking the polygons (7). The geometric information of this volume (sampling rate, number of samples, crosslines, inlines, etc…) are critical for polygon-to-points conversion. Specify Unique project name and suffix (8). By default, the point set converted from a polygon will be decimated at 5 inlines x 5 crosslines x 5 vertical samples (9). You can change them to different values. This decimation will be beneficial if the machine learning algorithm of choice is computationally intensive (such as Probabilistic Neural Network - PNN). The computational cost increases exponentially with the number of points in a point set.

After all parameters are set, click *Execute* (10).

Output file naming convention

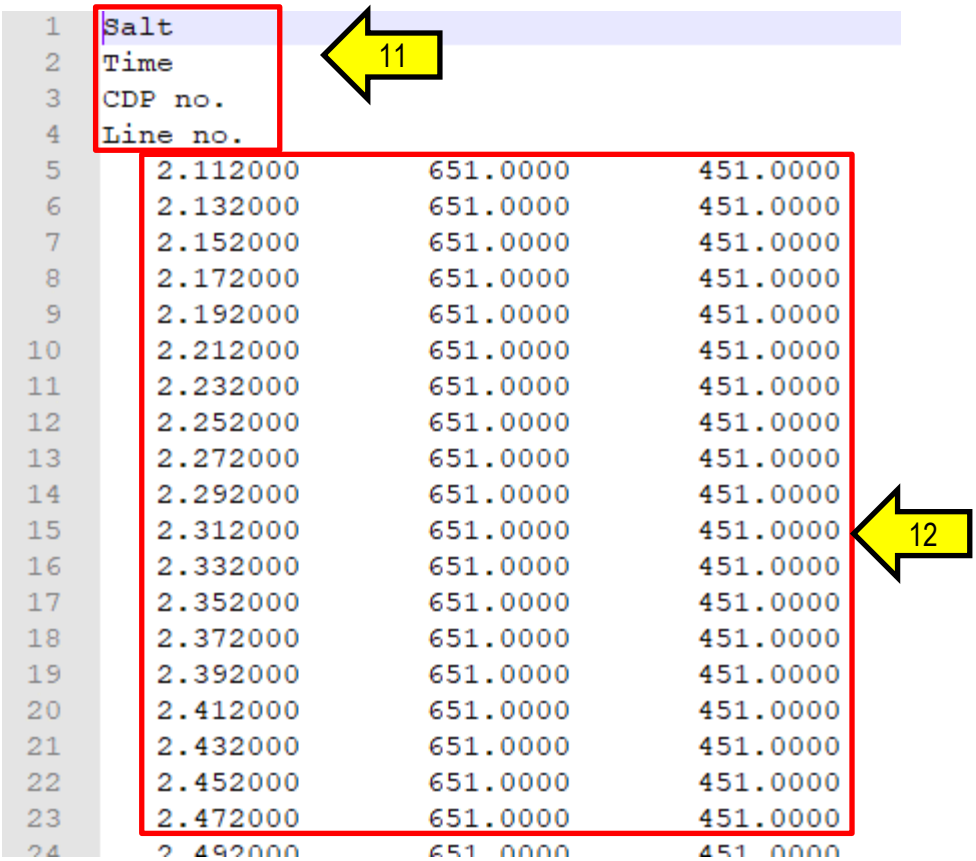
Program **polygon_to_points** will always generate the following output files:

Output file description	**File name syntax**
program log information	polygon_to_points_*unique_project_name_suffix*.log
Program error/completion information	polygon_to_points_*unique_project_name_suffix*.err

where the values in red are defined by the program GUI. The errors we anticipated will be written to the **.err* file and be displayed in a pop-up window upon program termination. These errors, much of the input information, a description of intermediate variables, and any software trace-back errors will be contained in the **.log* file.

Results

The converted point set file name will have the following syntax: **<polygon_file_name>_<unique_project_name>_<suffix>.pnt**
Below is a sample of what a converted point set file looks like in a text editor:



The first 4 lines (11) of a converted point set file is: Facies name, Time/Depth (1st column), crossline number (2nd column), inline number (3rd column). Each subsequent line consists of 3 values defining the geometric coordinate of a point within a seismic volume: time/depth, crossline, and inline (12).

Since AASPI can only define a polygon in either inline, crossline, or time slice display, AASPI point set is 2D. However, if you can define a 3D point set from external program, you can mimic the structure of AASPI point set file to create a 3D AASPI point set.

These geometric coordinates will be used to extract data value from seismic attribute in the next step of AASPI machine learning workflow: generate training data.