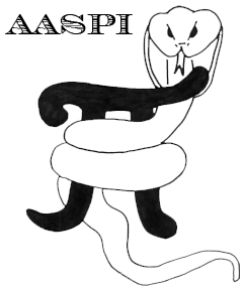


MACHINE LEARNING TOOLBOX – Defining Polygons

Contents

Introduction

In supervised classification, interpreters first pick a set of seismic voxels and assign it to a specific facies of interest, such as salt or carbonate deposit. This is essentially why it's called "supervised". The most intuitive way to assign a set of seismic voxels to a facies is to pick a polygon in a 2D display (inline profile, crossline profile, or time slice). Using **aaspi_corender**, interpreter can pick polygons of different facies on a blended image of multiple attributes at once.
On a side note, in well logs, facies assignment is done via spreadsheet calculator, where each well log sample is going to be assigned to a facies (such as sand or shale) based on the value of other logs (e.g. sand exhibit low gamma ray values, while shale exhibits high gamma ray values).

Output file naming convention

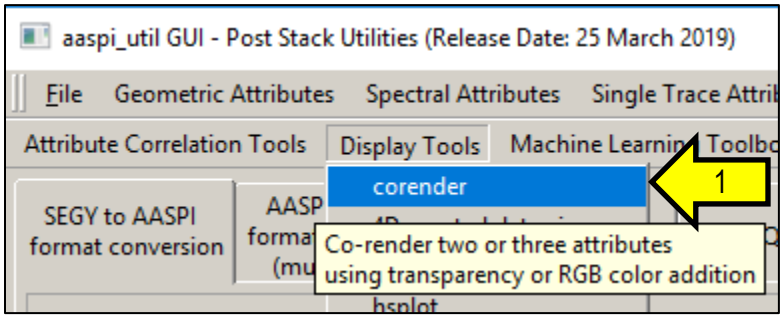
Program **aaspi_corender** will always generate the following output files:

Output file description	File name syntax
program log information	*aaspi_corender*.log

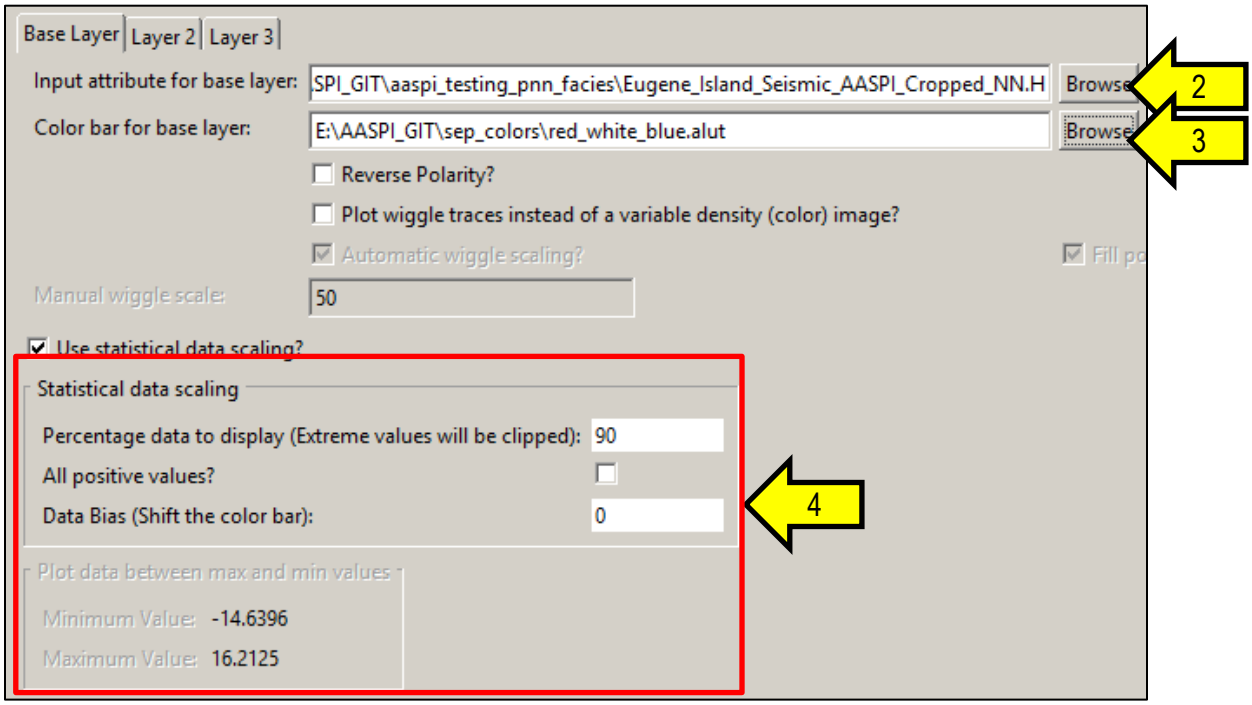
All input information, a description of intermediate variables, and any software trace-back errors will be contained in the **.log* file.

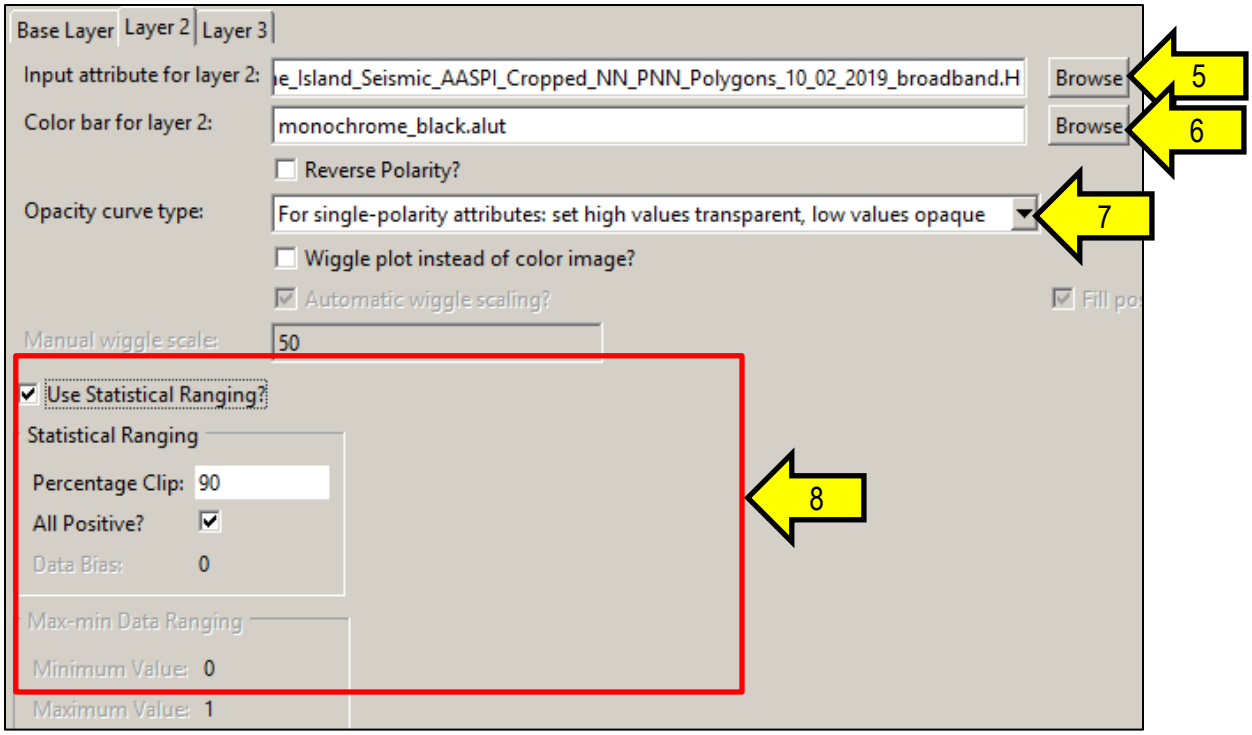
Running aaspi_corender to define polygons

To run **aaspi_corender**, go to *Display Tools* → *corender* (1).



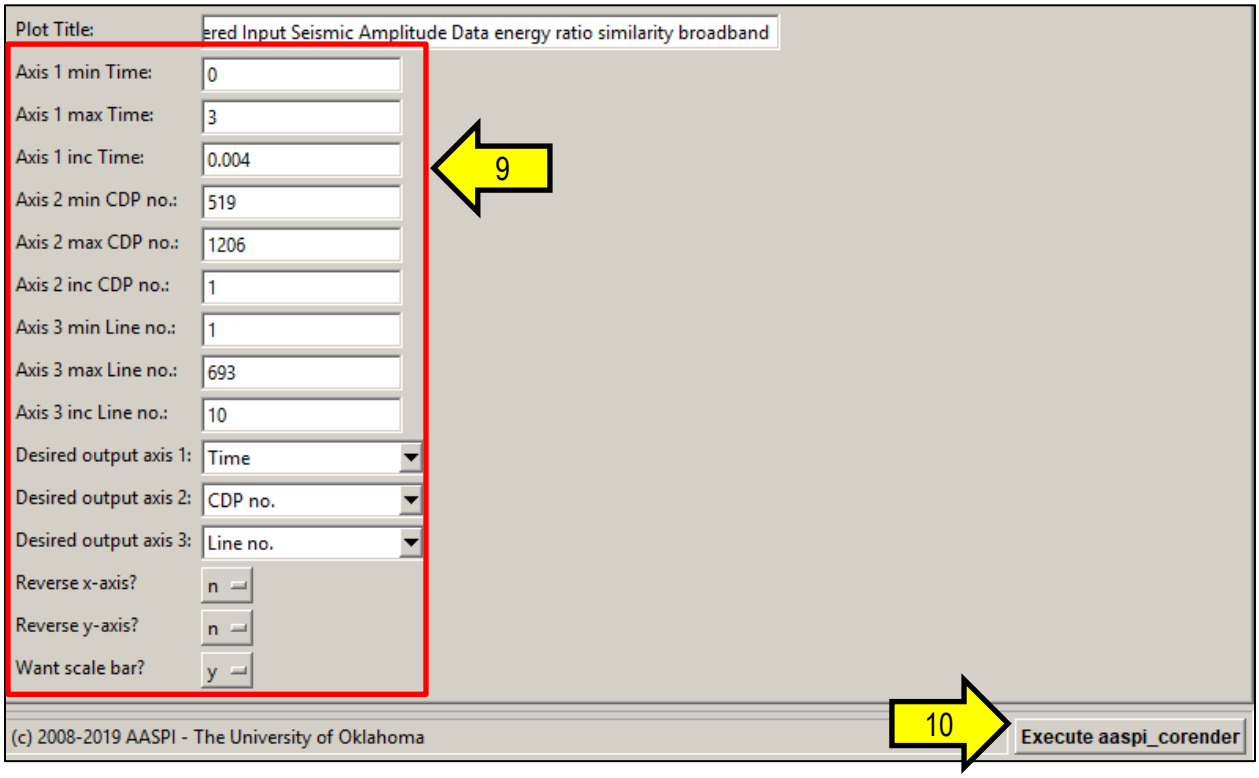
In this example, we will corender a seismic amplitude volume with a coherence volume in order to pick salt facies. To do so, browse the base layer to the seismic amplitude volume (2), browse the color bar to **red_white_blue.alut** (3), and set up scaling (4). Browse the 2nd layer to the coherence volume (5), browse the color bar to monochrome black (6), select opacity curve type to "high values transparent, low value opaque" (7), and set up scaling (8).



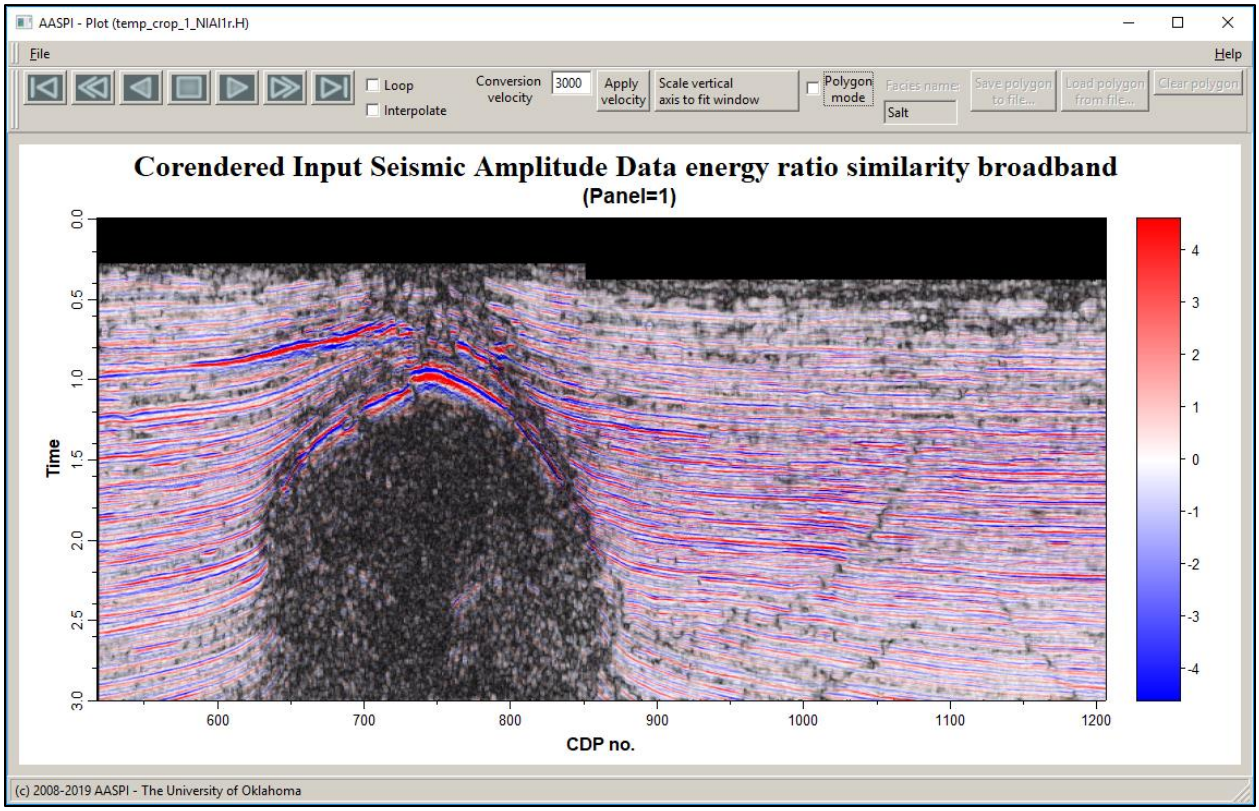


Note that you can also plot a single attribute in the base layer and perform polygon picking, without the need to corender. However, we recommend corendering two to three attributes together to better delineate different facies.

Set up geometric parameters (9) and hit Execute button (10).

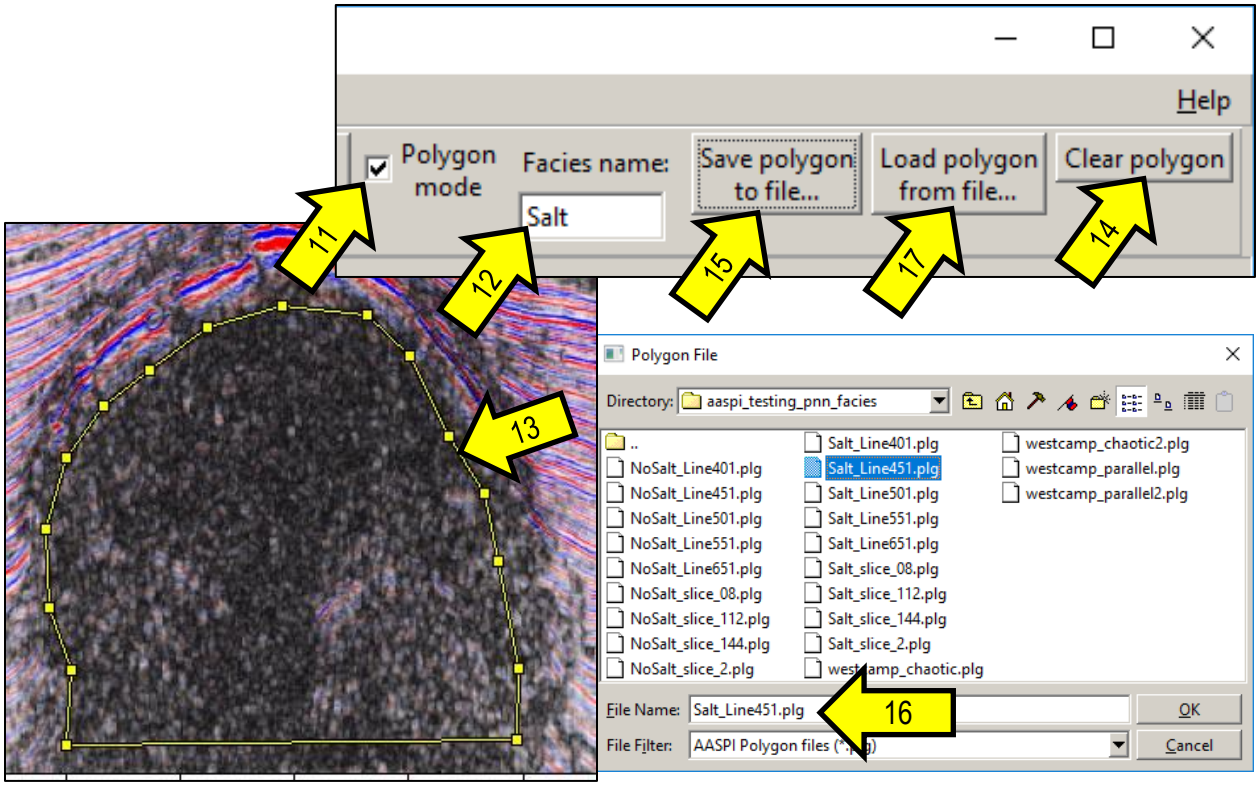


Below is a corendered image of seismic amplitude and coherence on an inline profile:



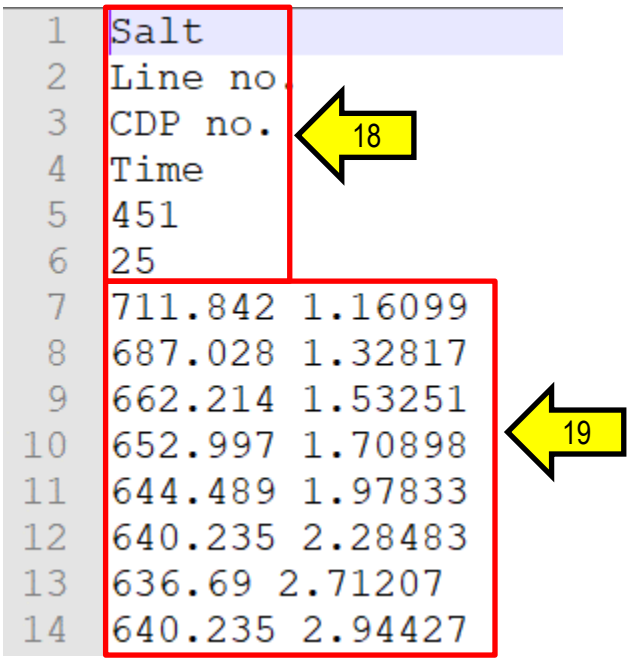
To pick a polygon, checkmark "*Polygon mode*" (11). Facies name text field and the three other buttons will be enabled. Specify facies name (12) and start clicking around the facies of interest (13) to define a polygon. For now, this polygon tool doesn't allow user to change the coordinate of the picked vertices, so if you make a mistake, simply click the "*Clear polygon*" button (14) and start over again. After you finish picking a polygon, click on (15) "*Save polygon to file…*" to save the picked polygon to an AASPI text-based polygon file (*.plg) (16). For your reference, you can also load and display a picked polygon using the (17) "*Load polygon from file…*" button. However, keep in mind that the display configuration of the corender program must match that of the polygon file (e.g. you can't display a time-slice and load a polygon that was picked on an inline profile).

Note: When the polygon mode is enabled, you cannot move to next display panel. To move to a different line, uncheck polygon mode first. In this manner, each polygon is associated with one and only one panel at a time.



Results

Below is a sample of what an AASPI polygon file looks like in a text editor:



The first 6 lines (18) of a polygon file are:

- Facies name,
- Panel type (in this case, inline),
- 1st column (in this case, crossline),
- 2nd column (in this case, time),
- Panel number (in this case, the inline no. on which the polygon was picked)
- Number of picked polygon vertices.

Each subsequent line consists of 2 values defining a polygon vertex (19). Note that from top to bottom, the order of these vertices are exactly the same as when they were picked.

These polygons will be converted to sets of points (i.e. vortexes) in the next step of AASPI machine learning workflow: **polygon_to_points**.