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Exporting Matrix Files from TIN MODEL - Multiple Depth Source Options

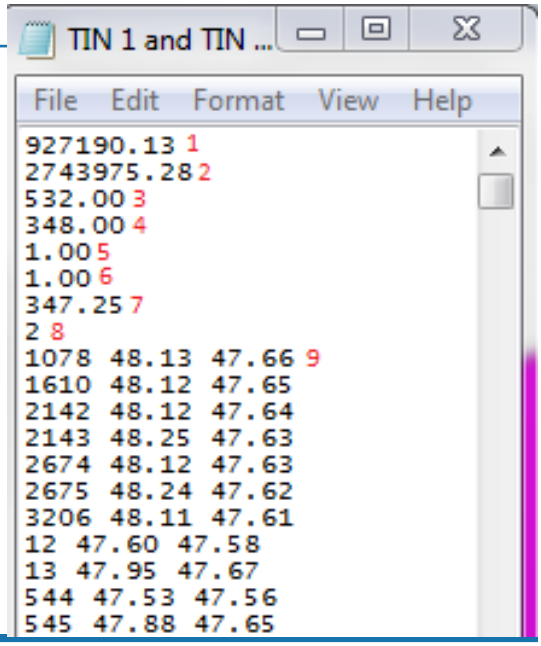
By Christian Shaw

One of the most attractive parts about the TIN MODEL program in HYPACK® is its ability to export a matrix file. These matrix files are used for DREDGEPACK®, Final Products and survey planning purposes. The TIN MODEL program allows you to load multiple surfaces and export the data within the cells of the matrix.

Matrix File Format

First lets take a look at the matrix file format:

FIGURE 1. *Matrix Format*



1. Corner X
2. Corner Y
3. Width
4. Length
5. Resolution X
6. Resolution Y
7. Heading
8. Matrix Type
9. Cell #, Depth 1, Depth 2

This is the basic type of matrix. There can be more depths stored in section 9 if it has been updated by a HYSWEEP® system.

Filling a Matrix During Acquisition

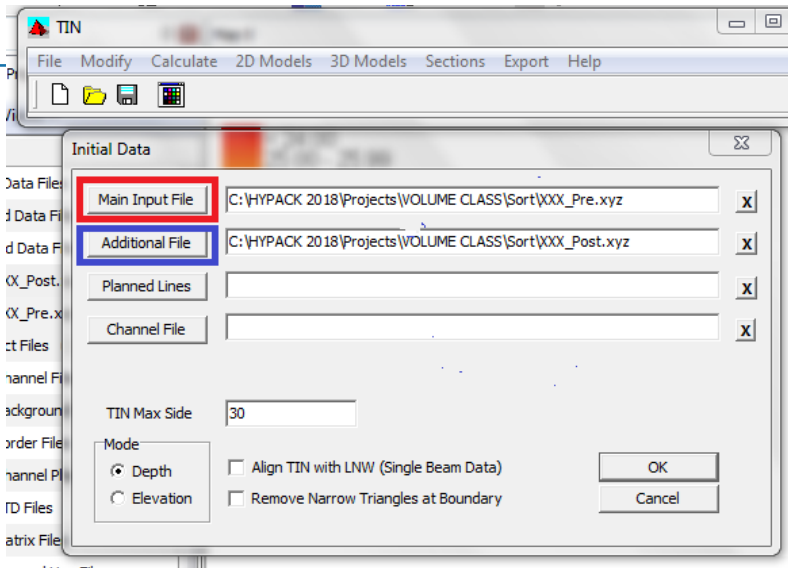
If you use a matrix in DREDGEPACK® with a depth device, and the matrix is being updated, Depth 2 is changed according to the cutting tool measurements.

If you are using a matrix in the SURVEY program, only Depth 1 is changed by replacement of its value.

Exporting a Matrix from TIN MODEL

1. In TIN MODEL, select FILE-NEW and load one or more surfaces.

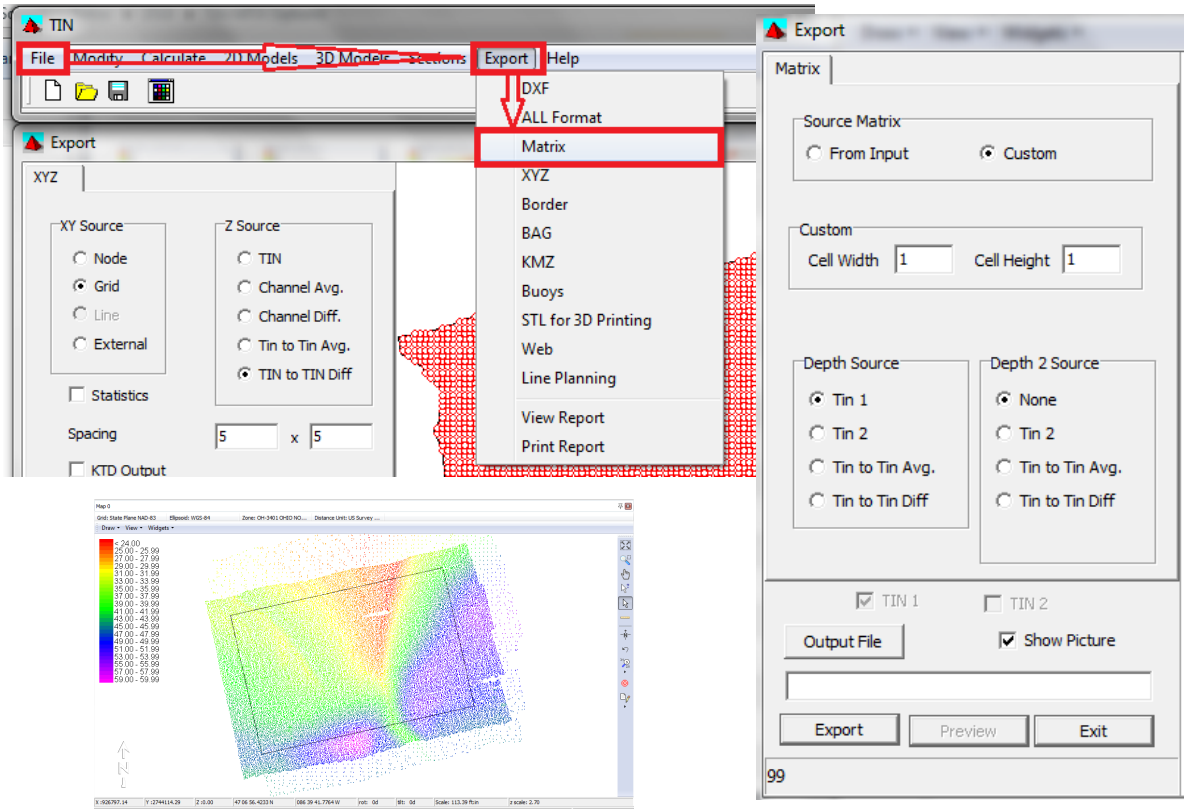
FIGURE 2. Loading Two Surfaces to TIN MODEL



- **Main Input File** should be the pre-survey or the survey that is the oldest surface.
- **Additional File** should be the post-survey or the survey that is the newest surface.
- **TIN Max Side**
- **Search Radius** should be large enough to connect all soundings to make a solid surface.
- **Mode** should match your geodesy settings.

2. **Select FILE-EXPORT-MATRIX.** The Matrix Export dialog appears.

FIGURE 3. Exporting the Matrix

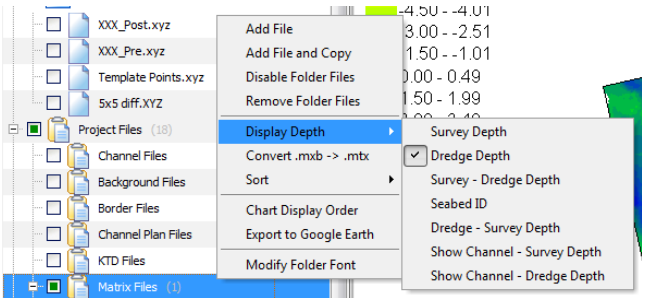


You will see the following options:

- **Custom Matrix** allows you to set the resolution of the matrix and automatically builds the matrix around the extents of the data. The smaller the value, the larger the output file size.

- **From Input:** For this option, you are responsible for creating a matrix in the MATRIX EDITOR. This can be attractive if you are on a project for a long period of time; you can have one matrix, which enables you to maintain the same orientation and map the data to the same cells every time.
- The **Depth Source** sets what value is stored in each cell for each stored depth section in the matrix. This is as described at the beginning of this article.
  - **TIN 1:** Main Input file depth
  - **TIN 2:** Additional file depth
  - **TIN- to-TIN Avg:** The average of TIN 1 and TIN 2 depths. This includes all depths found in each cell.
  - **TIN- to-TIN Diff:** The numeric difference between the two surfaces at the cell center.

In the HYPACK® Shell, you can toggle your display between the two depth sources stored in your matrix: Right-click on the Matrix Files folder in the Project Items list and change from “Survey Depth” to “Dredge Depth”. (These are Depth 1 and Depth 2 sources, respectively.)



As a last point, it is important that you also change your project colors to represent the depths displayed. Because Depth 1 and Depth 2 typically have different value ranges, you will make each color palette accordingly.

In the examples shown in Figure and Figure 5, I have saved TIN- to-TIN Avg. as the 1st depth source and the TIN- to-TIN Diff. as the 2nd. Notice the color palette difference. When displaying Survey Depth (Average Depth) the depths are normalized as being the average depth for each cell. “Dredge Depth”, representing the difference between the depths in each cell, the palette is much different and will be relative to zero.

FIGURE 4. *Depth 1—TIN-to-TIN Average*

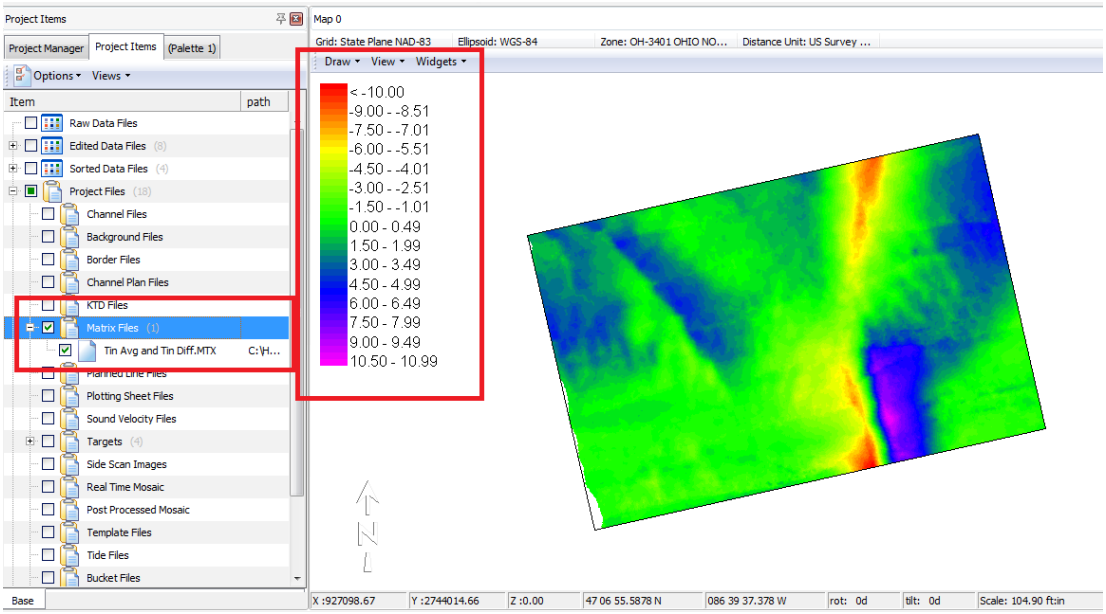
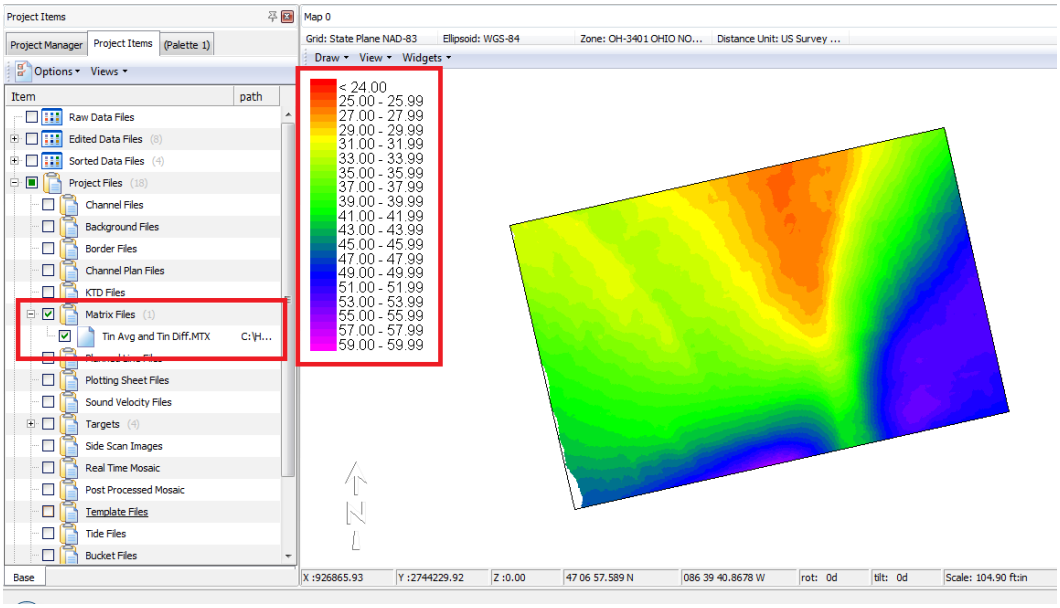


FIGURE 5. *Depth 2—TIN-TO-TIN Difference*



Once you learn how to store different depths into cells in a matrix in TIN MODEL, you can take more advanced looks at your data set and make decisions about the surface as measured by your survey equipment.