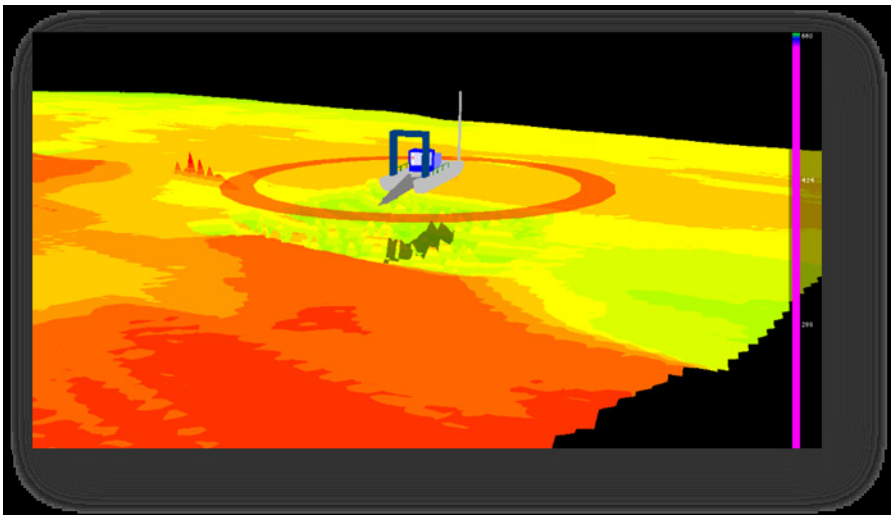
Enhancements to the CUTTER.DLL

By Jerry Kniesly



Recently I went to visit JF Brennan in Green Bay. They are using the CUTTER.DLL to show the cutter head dredge. The key change was the ability to offset the design so that they removed material in lifts.

To go back to the beginning, the project is an environmental dredge project where a survey was done to determine the current bottom. The boring samples determine the depth of the contaminant so there are two depths: a current bottom and a contaminant depth. Both of these depths are then taken into the TIN MODEL program to create separate matrix files.

A matrix file can contain 2 depths. The first depth is the SURVEY depth and the second depth is the DREDGE depth. In our case, the SURVEY depth is the design depth because when the dredge updates a cell the dredge depth is changed but the survey depth is not. The two matrix files are merged into a single file so that the limit of contamination is loaded as the SURVEY depth and the current depths are loaded into the DREDGE depth. We now have a difference matrix. The reason for the difference matrix is that the operator can remove material until the DREDGE-SURVEY value is 0. When this is 0, the operator has removed the contaminated material in that cell. In normal dredging, the operator removes material to a depth/elevation. In this type of dredging the template changes on a cell-by-cell basis.

A few years ago, Pat went on a trip similar to this. He had Lazar changed the TIN MODEL program so that you could make a TIN model of the boring sample depths and generate a CHN (channel file) of the TIN surface. (Select FILE-SAVE and change the file type from TIN to CHN.)

A CHN file is normally created by ADVANCED CHANNEL DESIGN. By allowing the TIN MODEL program to do this, a much more complex channel can be generated easily. The new problem that arose from that is that a large area contour dredge project requires a huge CHN file. Recently on a project up north a CHN was created over a 2500x1500 ft area with a 1 ft node separation. That creates 3.75 million points; Way too many for a CHN file! Try loading that into DREDGEPACK as the Channel and the program will take forever to load it and will probably fail. Because of this, there is a change to DREDGEPACK so that you can load a Matrix file as a Channel . This allows the computer to load a huge Matrix file as quickly as a channel.

In the following image, the profile in the cutter.dll device window shows the cutter head as a point. It is key to note the yellow line is the design and the gray area is material. The red line represents the first lift and the black line is a 1 ft buffer to dig to. It is almost like a template

with overdredge except that it is ’under dredge’. The operator can feel free to remove material above the red line, but when he gets to the red line he has to be careful. This is a useful feature in the contaminated dredge projects that we have been involved in lately.