



Creating a Dredge Simulator for your Digging Area

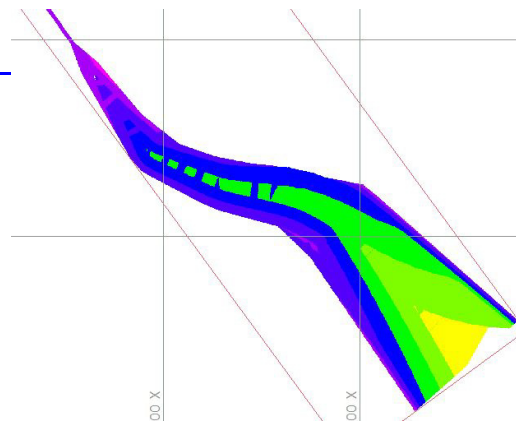
By Rob Baird

We were recently asked to build a dredge simulator for a cutter suction dredge operator without any HYPACK® experience. His supervisor wanted him to get accustomed to the displays he would see while using DREDGEPACK®, but all he had to work with, at that point, was an XYZ file of the pre-dredge survey. We were faced with a daunting task, but we were able to create a template for building exactly this type of simulation. Here it goes...

The XYZ file was all we had to work with, but that provided the starting point for creating a matrix and a template for digging.

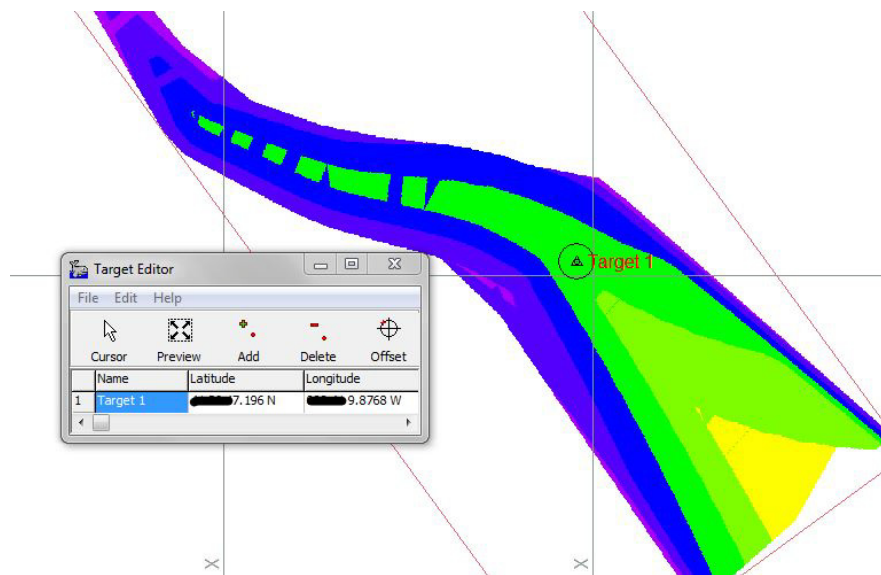
1. **We ran the XYZ file through TIN MODEL program and exported a matrix.**

FIGURE 1. Matrix Generated in TIN MODEL from an XYZ File.



2. **I created a target in the matrix area and used those coordinates to zoom in on our position in Google Earth...** As usual, the coordinates were changed to protect the innocent.

FIGURE 2. Target Coordinates Provide Position in Google Earth™



3. **Next up was to take my Google Earth picture and create a Georeferenced TIF.** If you haven't created a Georeferenced TIF from a .JPG, .TIF or .BMP before, check out this link to see how to do it (authored by HYPACK editor/ tech writer Judy Bragg):

http://www.hypack.com/new/portals/1/PDF/sb/10_08/Georeferencing%20Images.pdf

FIGURE 3. Matrix and Target File Overlaid on TIF Chart



- The next step was to **set up our simulator in HYPACK® HARDWARE**. We used two different instances of the HYPACK® Generic Simulator (sim32.dll) in our configuration. The first is shown in Figure 4 as Dredge GPS and placed on the boat. The second simulator is placed on a mobile and shown in Figure 4 as Depth Gauge, serving as our depth device.

FIGURE 4. The Hardware Configuration

- The HYPACK® Bucket Footprint (Vulcan.dll) was configured to update the matrix with 3x3 cells to represent a 3-foot cutter head.**

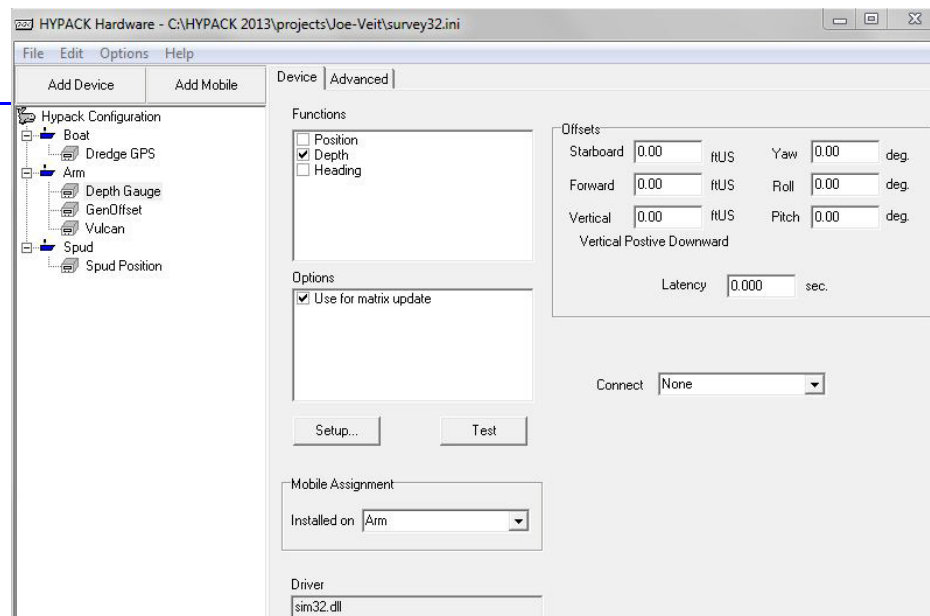
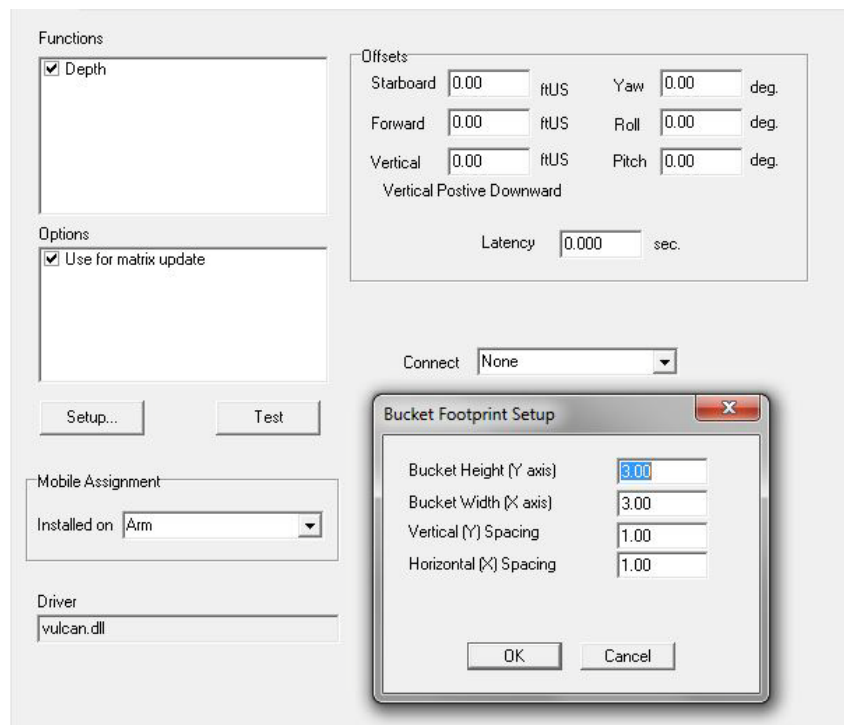
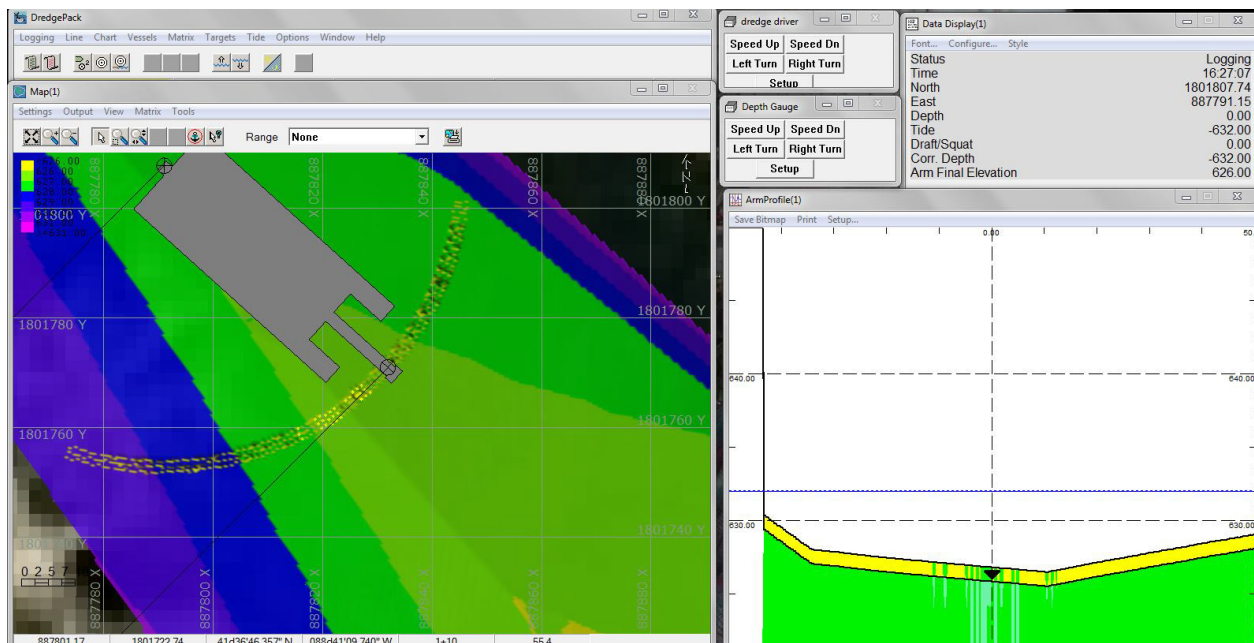


FIGURE 5. Configuring the Vulcan Driver



6. We were finally ready to **go into DREDGEPACK®** and test out our simulator. We loaded the matrix into DREDGEPACK® to serve as our reference for the map display and cutter head profiles.

FIGURE 6. Testing in DREDGEPACK®



Although we made some mistakes by digging too deeply in our first few passes in the simulator, we had accomplished what we set out to do. Besides, any mistakes made during simulation are less likely to occur during actual digging.

The matrix was being updated in real-time, while the Arm Profile window showed a profile view of the cutter head against the surface depth (dredge matrix).

There are many aspects of a dredge job that we couldn't possibly hope to simulate in the office, but cutter suction dredge operators can learn more about our displays in HYPACK® and DREDGEPACK® with this type of simulator, and get more comfortable before digging in the field with DREDGEPACK®.