RhinoCAM at Wrangell Public High School

Students in the digital fabrication class in the Wrangell Public High School (Wrangell, Alaska) are getting valuable hands-on experience in CNC programming and machining using RhinoCAM from MecSoft Corporation. Drew Larrabee, industrial technologies instructor at Wrangell Public Schools started his teaching career as a Geologist teaching Math & Sciences, but has spent the last 4 years teaching digital fabrication where he and his class produce some wonderful projects.

> ***I love working with students and teaching them how to build things with their minds and hands using new technology. I find there is great satisfaction in building something and seeing the finished product come to life!***

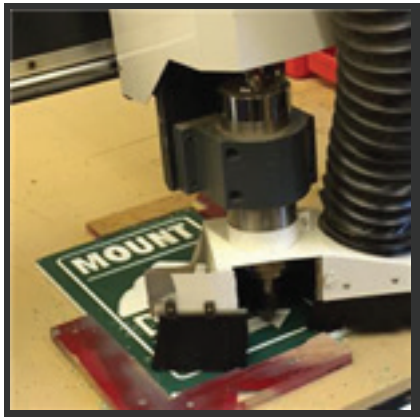

Figure 1
V-Carving directional signs for the Mount Dewey hiking trail.

With the goal of introducing more technology into his classroom, Drew was able to add 7 new computers in the shop - complete with Rhino 5.0 and RhinoCAM 2015, a 5x10 CNC Router, a Roland vinyl sticker cutter, a 18"x24" Universal laser cutter (50watt) and a Felix dual extrude 3D printer, all with the help of grants from the state Department of Labor and Department of Education.

Drew's class now produces all of the sports plaques used by the school as well as many other exciting class projects. In addition to teaching students how to use RhinoCAM, Drew also assists them in obtaining their Rhino 5.0 Level 1 certification!

Why RhinoCAM?

In the beginning we started out using BobCAM® but kept having to buy additional modules for basic 2½ axis machining. It was also difficult to learn while learning Rhino without the ability to change our Rhino models easily. It was wonderful this year to be able to switch over to RhinoCAM where changes to the Rhino 3D models are easily updated in the CAM operations!

The Mount Dewey Trail Project

In a recent project, Drew and the class designed and manufactured a series of trail signs pointing the directional route along the Mount Dewey hiking trail in Wrangell, Alaska. The 2-dimensional designs were drawn in Rhino 5.0 and machined with RhinoCAM from dual-color plastic stock. The V-Carve Roughing, V-Carve Finishing, Profiling and many other 2 and 3 axis toolpath strategies are all included in the Standard configuration of RhinoCAM. See Figures 2, 3 and 4 below.

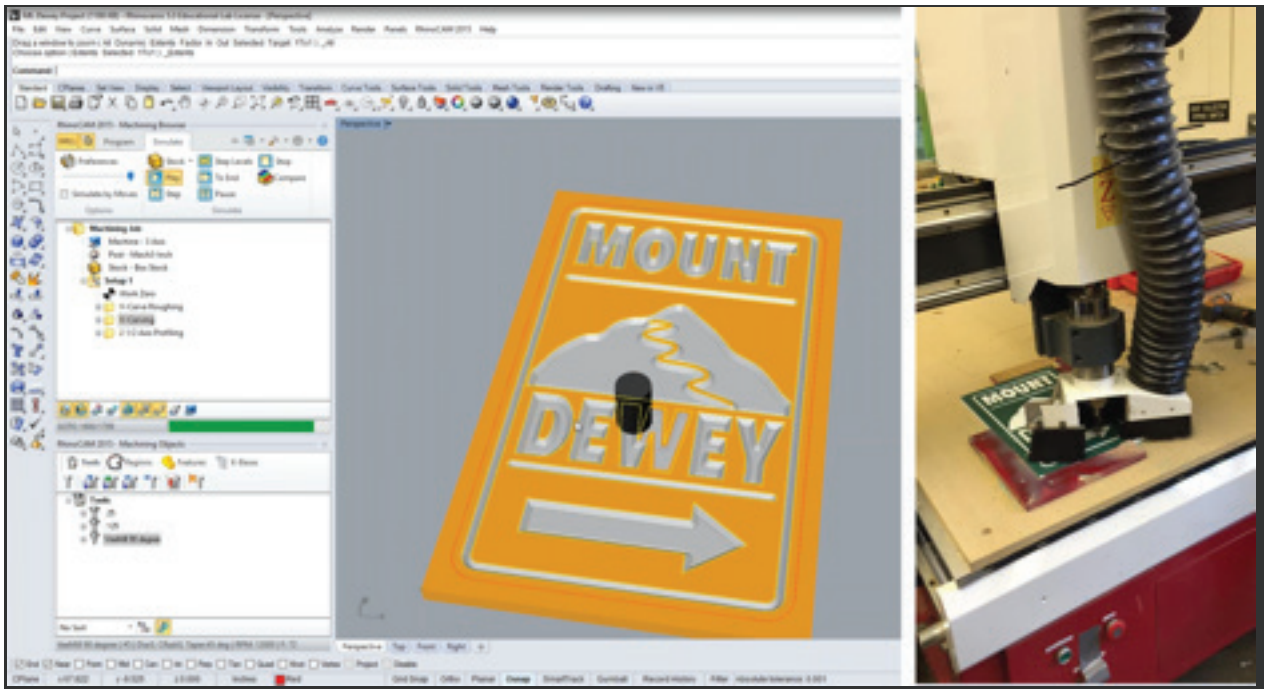

Figure 2 - One of the Wrangell Public High School's 2015 fabrication lab projects was to design and manufacture a series of trail signs pointing the directional of the Mount Dewey hiking trail in Wrangell, Alaska. On the left, the RhinoCAM plugin is shown performing a Cut Material Simulation of the 2½ Axis V-Carve finishing operation. In the Machining Job tree you also see the 2½ Axis V-Carve Roughing and the 2½ Axis Profiling operations.

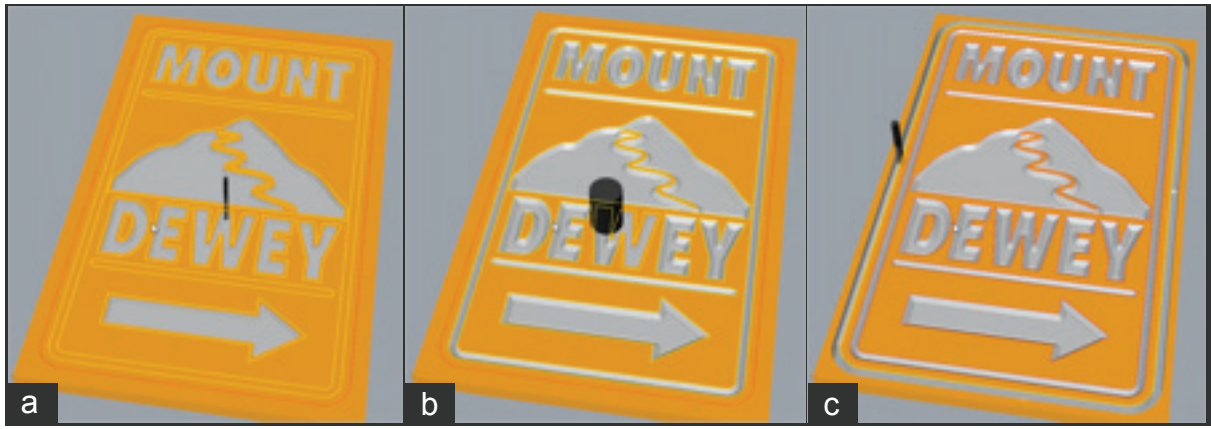

Figure 3
The Cut Material Simulation results are shown after each operation
(a) 2½ Axis V-Carve Roughing
(b) 2½ Axis V-Carve finishing and
(c) 2½ Axis Profiling operations. Note the Bridges & Tabs left during the Profiling operation.

Figure 4
The series of Mount Dewey trail signs laid out in Rhino 5.0

The 12-Foot Jet Boat Project

In Drew's Marine Fabrication class, students manufacture a full-size 12-foot aluminum jet boat (shown here). In previous years, the design's components were plasma cut from aluminum sheets and then welded during assembly. However, the heat from the plasma caused warping in the material.

In Drew's most recent class, the project was done completely in Rhino and all components were machined on their CNC router using RhinoCAM toolpaths. This eliminated the need for plasma cutting and solved the warping issue altogether. See Figures 5, 6 and 7 below.

Figure 5 - Students from Wrangell Public High School's Marine Fabrication class assemble a full-size 10-foot aluminum tram from components cut with RhinoCAM.

Figure 6 – Aluminum components for the full-size 10-foot aluminum tram cut from RhinoCAM toolpaths by students in the Wrangell Public High School's Marine Fabrication class.

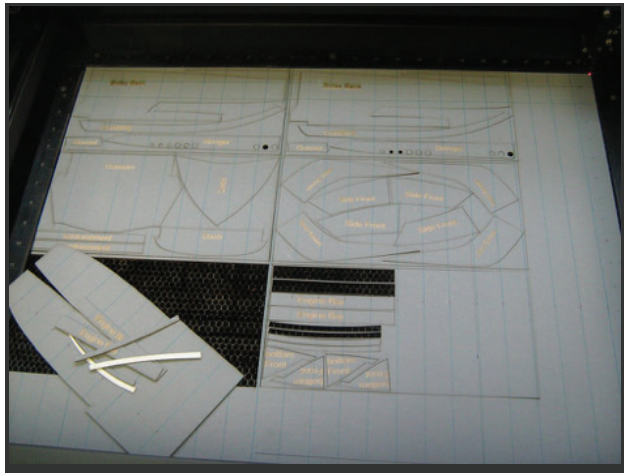

Figure 7 – Laser cut mock-up components for the aluminum tram used to work out assembly and fabrication issues prior to production in the Wrangell Public High School's Marine Fabrication class.

More information:

For more information about the topics discussed in this article you can refer to the following links:

- Wrangell Public High School website
- Wrangell Public High School on Facebook
- RhinoCAM MILL module and product configurations
- Other RhinoCAM modules and Mecsoft products
- Rhino 5.0 CAD modeling tools