

The Ninth Hole

An exercise in WCS5 boundaries

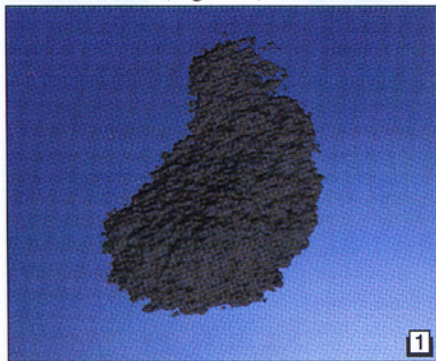
by R Scott Cherba • Images by the Author

World Construction Set is often used for golf course visualization. Let's look at how we can sculpt a green with Area Terrafactors, Ecosystems, Environments, and a little luck. (From the look of that water hazard in the rendering, we're going to need all the luck we can get.)

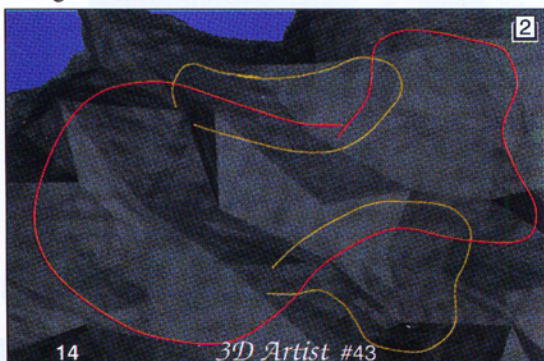
As always, we start with terrain. Use some you have handy, or create it with the Terrain Generator. We're looking for an island about 50 meters wide with a four-meter grid size where we can plop down a green, rough, and some sand traps. If you would like to use the Components mentioned below, this is a good time to download and extract the zipped project file that has them at www.cherba.com/resource.

Greens-R-Us

First we're going to use Area Terrafactors to carve out a green and sand traps. WCS5 makes this easy. Open your overhead camera view and zoom in to where you want to digitize your green. Go to the Terrain Task Mode in the Scene-at-a-Glance, select the Area Terrafactor category, and click the Create button in the vector section of the toolbar. Left-click points to define the vector for your green. Right-click when you're done and name it Green (Figure 1). Choose the



freshly downloaded Green-Island Area Terrafactor Component from the Component Gallery. Go to the Elevation & Roughness page of the Area Terrafactor Editor and change the Elevation to something that makes sense in your green area.



Sand trappings

Create another Area Terrafactor on the north side of the green, name it Sand Trap-North, and load the Sand Trap-North Area Terrafactor Component. Repeat on the south side of the green (Figure 2).

If you check the General page of the editors you'll notice that all three Area Terrafactors are set to Overlap with the same Priority. That means that, where the vectors physically overlap, the terrain effect will be additive. The order of application is determined by the Evaluation Order. The Sand Trap values are higher than the Green, so the green is evaluated first and the sand traps are cut into the resulting altered terrain.

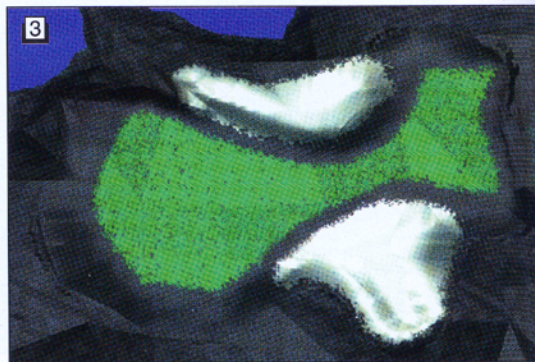
What if your vectors aren't as smooth as you'd like? Open the offending Vector Editor (Vector Task Mode or Database) and interpolate the total number of points you'd like on the Points page. Go to the Smooth page and apply 50% smoothing to round off the vector. This is a good way to create smooth vectors without having to digitize them in excruciating detail.

Ecosystem

Go to the Land Cover Task Mode, select the Ecosystem category, and click the Add or Clone button. When the Component Gallery opens, load the Green-Island Ecosystem Component. Repeat to add the Sand Trap Ecosystem Component. Expand the Vectors category in the lower Scene-at-a-Glance window. Click and drag the Green vector up and drop it on the Green-Island Ecosystem. Apply the Sand Trap-North and Sand Trap-South vectors to the Sand Trap Ecosystem in the same manner. These vectors now have both Area Terrafactors and Ecosystems associated with them.

Which Ecosystem will be rendered where the vectors overlap? It depends. If we select Overlap and give them the same Priority, the Ecosystems will mix in the overlapping area. If we assign one Ecosystem a higher Priority than the other, the higher Priority Ecosystem will render in the overlapping area (no mixing). Since the Sand Trap Area Terrafactor is cutting into the Green, the Sand Trap Ecosystem has been given a higher Priority to render it in the overlapping area.

Increase the Fractal Depth to 7 and render a preview (Figure 3). Notice the blockiness of the resulting effect. Remember the four-meter grid terrain we set the project



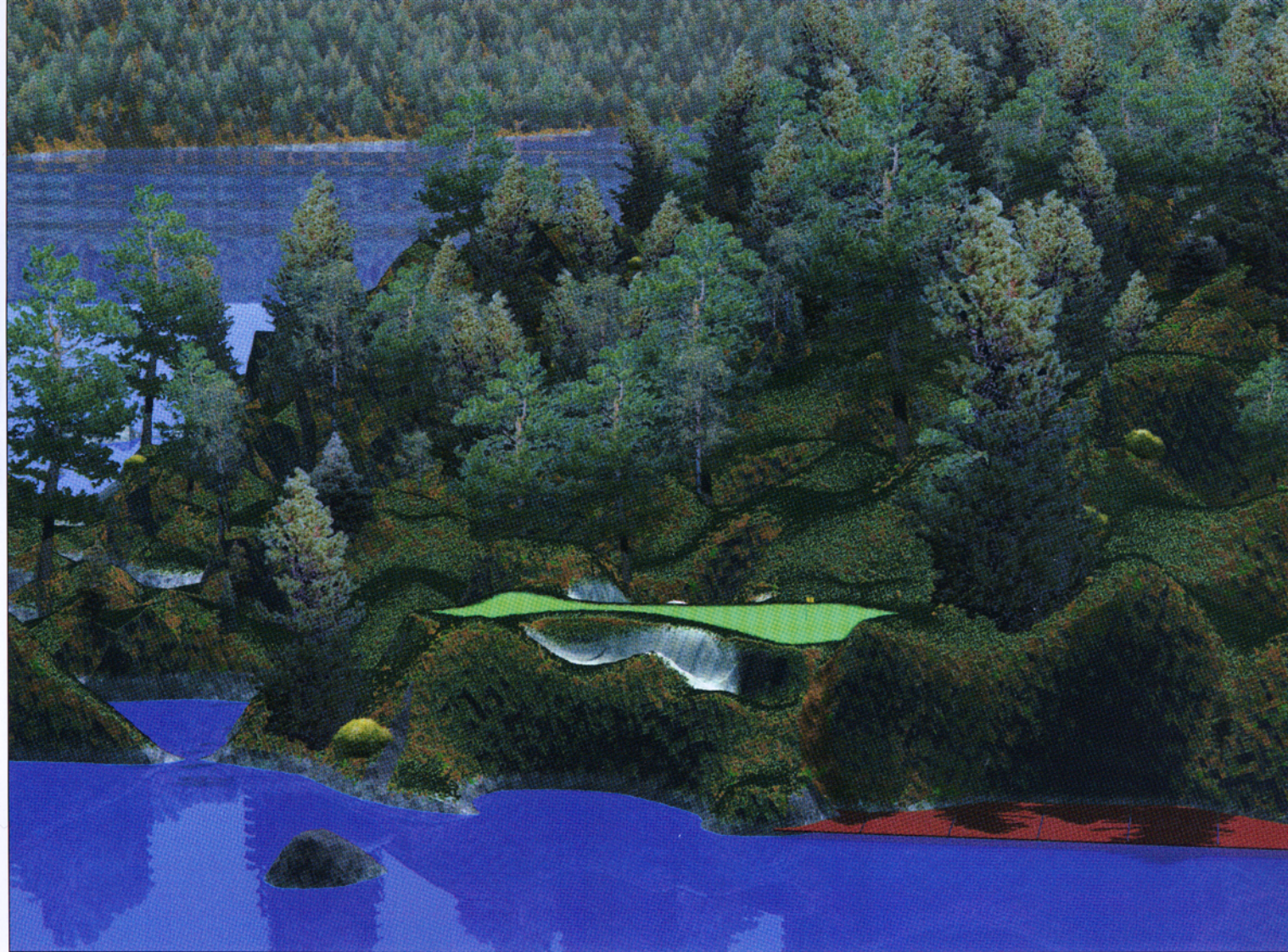
up with? That's the surface WCS has to work with when it applies the Area Terrafactors. Use the Data Interpolator or Import Wizard to create DEMs in your green area with a grid size of about 0.2 meters. If you use the Data Interpolator set the Elevation Var% and Max Flat Var% to 0 to make smooth DEMs. If you don't, your DEMs will develop an unnatural chunky look. Render another preview and you should notice an improvement (Figure 4, Grid Size 0.25m).



The preview render shows the Green-Island Area Terrafactor covered with Green-Island Ecosystem cut by the Sand Trap Area Terrafactors covered with Sand Trap Ecosystem. Select Edit Profile in the Green-Island Ecosystem Editor to see how we obtained the edge feathering on the green (Figure 5). The Green-Island Area Terrafactor reaches full effect two meters in from the vector. To match this, the Green-Island Ecosystem edge feathering has been set to start two meters in from the vector and to reach full effect at 2.5 meters.

Environmental issues

The green and sand traps look pretty good. All we need is something for the Ecosystems to feather into. Right now we see Ground Effect around the green and sand traps because that's the only global Land Cover we have in the project. What we need is an Environment or two to complete the scene. Select the Environment category in the



Scene-at-a-Glance and click the Create button. Draw a vector around the island and choose the Grass-Island Environment Component. In a preview render (Figure 6), the new Environment has replaced much of the Ground Effect. Create another vector-bounded Environment around the mainland in the background of your island scene and load the Forest-Mainland Component.

Just a few other touches and we're ready. To achieve the dark limestone Ground Effect look, use the Open Component Gallery button in the Ground Effect Editor to load the Limestone Ground Effect Component. To get the same water and wet limestone beach, go to the Lake Editor and load the Island Lake Component. Change the loaded lake elevation to match your scene.

renders. This will save render time.

This scene has many effects that will slow rendering and increase RAM usage. It's very likely that you will get an `æError initializing EffectsÆ` during a preview render. If that happens, open the Component Library and increase the Max Effect Memory until the error goes away. *Fore!*

R Scott Cherba is an independent photographer and animator in Tucson, Arizona. A geologist and naturalist, he documents and creates scenes of the American Southwest and Mexico. Last issue he wrote about creating seashores in WCS. You can reach him through his Web site at www.cherba.com.

Shadows

Shadows add an important sense of realism. We only need them for the end of the island that's in the foreground of our scene. Go to the Light Task Mode, make Shadows the active category, and click the Create button. Draw the vector around the portion of island in view of the main rendering camera. On the Shadows & Shadow Map page of the Shadow Editor, make sure Cast and Receive are checked. Select a shadow map quality and check the Use File box. WCS will create a shadow map file during the first render that will be reused on subsequent

