Subject: Re: Oceans
Posted by Rick Towler on Wed, 06 Apr 2005 19:13:09 GMT
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Ken Mankoff wrote:
> Hi Group,
>
> I have just been handed a project to image modern and paleo-ocean
> bathymetry, 3D temperature, and 3D salinity. On a 2 deadline.
>
> I can contour the bathymetry quite easily, and produce small-multiple
> images of the data in X,Y, and Z without a problem. That'll probably
> take a day. Now I have 2 weeks minus a day to do the rest.
>
> I don't have a whole lot of 3D experience in IDL and am wondering if
> anyone can provide a suggestion or code base that could help with this
> project.
>
> I know Rick Towler does some similar work, and I have a feeling the
> Thunderstorm Demo would be a good place to start too. If anyone has any
> other advice I'd love to hear it.

Hi Ken,

First thing I would do is order that new graphics card. :) The best "gaming" card you can afford (Geforce 6600GT or 6800GT are nice options). Really. You can burn up a lot of polys rendering large surfaces. But maybe you're set...

I can offer my camera object and the camdemo_di_cullnfly application. I personally do all but the simplest 3d visualizations with my camera. Yeah, easy for me, but it is really pointless to do 3d w/o some easy way to navigate. The di_cullnfly demo should introduce you to using the camera in an interactive sense and demonstrate view frustum culling which, if you'll be writing an interactive app, you'll probably want to consider at some point.

As for your bathymetry objects, I personally roll my own with a quad-strip/tri-strip meshing algorithm and IDLgrPolygon but you could use IDLgrSurface. You'll probably want to do the lighting at this stage as well since optimal lighting is most likely surface dependent. I have an app that allows for interactive "tweaking" of bathymetry (lighting, decimation, meshing, sampling, texturing) but it is *very* rough. I may be convinced to cough it up but with a huge YMMV/YGWYPF clause.

I don't know the best way to visualize 3d temp and salinity (I don't worry about the water, just the creatures in it :) Volumes are pretty much out of the question. Too slow. You could use IDLgrPolygon objects

as 3d contours but meshing would be a bit of a challenge (maybe QHULL?).
Presentation too would be tricky. Color coded opaque objects would be easy but you wouldn't be able to see the bathymetery except in x-section. Transparent objects would look "cool" but they would be a headache to manage with IDL's simple renderer (Karl, any progress on that new renderer ;). Another approach would be to texture a "billboard" that covers the entire draw window to display the current temp/salinity slice. A general solution would be very tricky though (but also very cool!) Hopefully others can give you some ideas.

If you are going to be creating fly thru animations let me know. I have a "director" object that while isn't really ready for public consumption allows you to create/save/load and run the camera along flight paths. Also, if you're on windows you'll want Ronn's IDLtoAVI .dlm.

Here's the URL. Yes, I am embarrassed that the pages are broken in Firefox/Moz but some day, s-o-m-e d-a-y, I will fix them...

http://www.acoustics.washington.edu/~towler/IDLviz.html

-Rick
