Subject: Re: Interpolation from a regular to an irregular grid?
Posted by JD Smith on Wed, 07 May 2003 16:13:21 GMT
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On Wed, 07 May 2003 02:58:12 -0700, Evan Mason wrote:

> Hi, I am kind of new to IDL, and have just started a new job in physical
> oceanography in Portugal. At present I am familiarising myself with
> IDL, which I will be using extensively.
>
> One of my first tasks is to find a way to input satellite collected wind
> data into an ocean model that is being run here. The wind data are
> regularly spaced, whereas the model requires the data in a series of
> irregularly spaced intervals.
>
> Looking through the messages on this group I see many questions and
> answers about working from irregular to regular grids using Triangulate
> and Trigrid, but I wonder if anyone knows how to do the reverse?
>

The reverse is the easy case -- just interpolate:

```
wind=exp(dist(10)/sqrt(10))

ocean_x=randomu(sd,30)*10
ocean_y=randomu(sd,30)*10
ocean_wind=interpolate(wind,ocean_x,ocean_y,CUBIC=-0.5)
```

This skips an important step you'll have to perform: converting your two coordinate systems to match each other. Note that INTERPOLATE treats pixels as integer-centered, e.g. the lower-left pixel is centered at [0.0,0.0]. I've always found this sort of grid rather unphysical, preferring instead to range from 0->n on the (left,bottom) to (top,right) edge of the grid, i.e. lower-left pixel centered at [0.5,0.5]. You'll need to keep this in mind when you convert your ocean grid coordinates into the logical coordinate system of the wind data array.

For very large grids, you might care about the finite curvature of the earth, in which case you'll want to interoplate on a sphere -- see the beautifully-named SPH_SCAT routine in that case.

Good luck,

JD