Subject: Re: mapping/interpolation from one irregular grid to another (different) irregular grid.
Posted by Paul Van Delst[1] on Thu, 26 Jan 2012 16:53:23 GMT
View Forum Message <> Reply to Message

Maarten wrote:
> On Jan 24, 10:04 pm, Paul van Delst <paul.vande...@noaa.gov> wrote:
>> I have a colleague who wants to map/interpolate data from one satellite sensor's footprint to another. The data is
>> defined in terms of pixel vs scan line which means the lat/lon grid (which is how the sensor FOVs are matched) for each
>> is quite irregular. He has performed loops over individual elements to do the interpolation, but as you would expect,
>> this is very slow in IDL. We need to speed it up (a lot).
>
> Which instruments are we talking about? I mapped MODIS on Aqua to OMI
> on Aura within the A-train. Although both grids are irregular, at
> least you know that they will pass over the same coordinate within a
> fixed time-difference. Both use TAI93 for time-stamping, once you know
> that, you can reduce the amount to data to a time-slice of about 10
> seconds.

MODIS (Terra/Aqua) and VIIRS (on Suomi-NPP)

> The key thing is to reduce the number of pixels as quickly as
> possible. For MODIS -> OMI I used the time difference, then searching
> in the 5x5 km pixels, and finally using that to search the 1x1 km
> pixels. That took the time down to about 45 minutes per orbit (from
> the brute force three weeks). That was good enough for me.
>
> I used the pixels centers for MODIS, and constructed pixel boundaries
> for OMI. The IDLanROI class is useful, I created a subclass to deal
> with the dateline.
>
>> My first thought would be to put both on a common regular grid, do the matchup/interpolation, and then somehow use
>> histogram with the reverse_indices trick to get the matched data back to the irregular grid (as detailed in JD's
>> histogram tutorial on idlcoyote.com).
>>
>> Does any of this make sense? I wanted to poll the IDL users out there that may have done this before recommending my
>> colleague embark on a a potential fruitless endeavour.
>
> Going to a regular grid first will introduce all kinds of
> interpolation artifacts. So, no it doesn't make sense to me. But it
> strongly depends on what you need to do, what instruments we're
> talking about (relative pixel sizes in particular). Is there any

> relation between the instruments?

They are both in sun-synchronous orbits but otherwise, no. Different platforms.

thanks to all for the tips and advice.

cheers,

paulv
