Subject: Re: Gridding Satellite Data
Posted by natha on Tue, 23 Aug 2011 17:22:50 GMT
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When I want to study different sets of data that are gridded
differently I always use nearest neighbour and I map everything on the
same grid. So, I think that my answer is IDL, using my own routines.

Subject: Re: Gridding Satellite Data
Posted by R.G.Stockwell on Tue, 23 Aug 2011 18:01:49 GMT
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>>
>>
>> "David Fanning" wrote in message
>> news:MPG.28bd5db2d56df65c989961@news.giganews.com...
>>
>> Folks,
>>
>> The typical sequence of events when you are contemplating
>> asking a question that requires remotely sensed data, say
>> from a satellite, is to start with some region you are
>> interested in. At the National Snow and Ice Data Center,
>> for example, this region is described as a rectangular
>> area in an XY or Cartesian coordinate system, with a
>> particular spatial resolution, say 25km. AT NSIDC, this
>> area is described by a "gpd" (grid parameter definition)
>> file. A map projection, of course, is a required element
>> in setting up the Cartesian coordinate system.
>>
>> The next step is to gather satellite data for the various
>> instruments (e.g., MODIS, MISR, etc) that happen to fly
>> over this area, and to grid the data into this rectangular
>> study area. At NSIDC, for example, a C program named mapx is
>> used to do this gridding. Mapx allows you to do the gridding
>> in several different ways, with different types of pixel
>> weighting, etc.
>>
>> This part of the process I have never been able to do
>> successfully in IDL.
>>
>> So, here is my question. What sort of software do YOU
>> use to perform this operation of taking available
>> satellite data and preparing it for a remote sensing
>> study?
>>
>> I am looking for what I hope will be a machine-independent

>> solution to this problem. In other words, I am hoping
>> for a solution I can run on a Windows machine. :-)
>>
>> Cheers,
>>
>> David
>>
>>
>> --
>> David Fanning, Ph.D.
>> Fanning Software Consulting, Inc.
>> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")
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The implications of the sampling, and what the desired analysis is, have a great influence on how to go about the next step. Simple gridding is often not a sufficient approach, due to the aliasing (etc) of the data if one does not have a geostationary satellite (and many many measurements are from lower earth orbit in precessing polar orbits).

So, I would give 2 answers.
1) I have a LOESS smoothing/interpolation code that has been used in the past for satellite data. It does local 3D least squares fitting to create a uniformly sampled dataset of measurements (lon,lat,time). Adding height would not be a problem. Depending on the goals of the analysis, it might be useful.
2) hire a post-doc and perhaps look into employing the Salby Method to the data (if appropriate).
Bonus answer 3) it depends. On the measurement, the orbit, the sampling characteristics, the goals of the analysis, and therefore a general solution might not be possible.

cheers,
bob

Subject: Re: Gridding Satellite Data
Posted by Klemen on Thu, 25 Aug 2011 09:43:22 GMT
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For aggregation from high resolution to low resolution data I used a combination of MATCH_2D (written by JDS) and ROIobj-
> IDLanROI::ContainsPoints.
The centre points of high resolution pixels that fell into the low resolution pixels can be then averaged as you wish (using simple mean, PSF...).

I tested procedure this only by aggregating MODIS level 3 data into SEVIRI (geostationary) grid. For MODIS data of about 1200 by 400 pixels and SEVIRI data of 600 by 200 pixels it takes about a minute to compute the mean of MODIS within SEVIRI pixels. I took a similar time to average of MODIS dataset having 1000 by 600 pixels and SEVIRI having 350 by 130 pixels.

It works on Windows (Vista and 7), in IDL 7 and 8. :)

Cheers, Klemen
