
Subject: Re: bounding box subsetting for lat/lon

Posted by [David Fanning](#) on Tue, 16 Feb 2010 13:04:33 GMT

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mankoff writes:

- > I'm wondering if a routine already exists that can subset a data set
- > based on non-square lat/lon limits. I have large 1D arrays of lat,
- > lon, and data, and want to do something like this:
- >
- > roi = WHERE(lat LE a AND lat GE b AND lon LE c AND lon GE d)
- > lat = lat[roi] & lon=lon[roi] & data = data[roi]
- >
- > But at a minimum I want to specify 4 lat/lon elements that do not
- > defined the edges of the box but the four corners, so the roi could be
- > a diamond shape (when projected on, say, the /cylinder projection).
- > And ideally I could define a path of n points defining a closed region
- > and get the indices back that lie within that region.
- >
- > Anyone know if this exists? I don't see it under the ROI section, and
- > searching for bounding box brings up too much noise.

The biggest mistake people make in working with map projections is working in lat/lon space. This is not a space where you can do much of anything worthwhile in terms of selecting and manipulating pixels. Life will be MUCH simpler if you work in Cartesian XY space, where it is quite easy to define your "box" by either its top, bottom and sides, or by any two opposite corners. You can use the Map_Proj_Inverse and Map_Proj_Forward routines to go back and forth between geographic and Cartesian coordinates.

Cheers,

David

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David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: bounding box subsetting for lat/lon

Posted by [penteado](#) on Tue, 16 Feb 2010 15:18:57 GMT

On Feb 16, 4:27 am, mankoff <mank...@gmail.com> wrote:

- > But at a minimum I want to specify 4 lat/lon elements that do not
- > defined the edges of the box but the four corners, so the roi could be
- > a diamond shape (when projected on, say, the /cylinder projection).
- > And ideally I could define a path of n points defining a closed region
- > and get the indices back that lie within that region.
- >
- > Anyone know if this exists? I don't see it under the ROI section, and
- > searching for bounding box brings up too much noise.

For the generic problem of finding the points inside a region in a plane, I would use an ROI:

```
oroi=obj_new('idlanroi',xverts,yverts)
interior=oroi->containspoints(datax,datay)
w=where(interior ne 0,nw)
if (nw gt 0) then begin
    datax=datax[w]
    datay=datay[w]
    dataval=dataval[w]
endif else (...)
obj_destroy,oroi
```

The trouble with the coordinates being lat/lon is that they are spherical coordinates. That means if you used that for lon as x and lat as y, you would actually be dealing with a polygon in a Cartesian space (cylindrical projection). Which may be what you want, but is not the same as the closed region in the surface of the sphere that has these vertices (which would presumably be connected by great circles, not straight lines). Also, any closed shape on the surface of a sphere defines two closed regions, depending on which side of the line you consider the inside.
