

Re: spatial autocorelation methods

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On Wed, 13 Oct 2004, jim wrote:

> *Your not being very clear in defining the problem.*

sorry – i'm discovering the language to describe it as i go. i'll elaborate as best i can. in essence we are comparing two data sets using one as the reference. the reference data set is of much finer resolution than the data set for the study. both data sets are byte images where the interpretation is that values above a certain value (say 11) are fires. they are not binary images.

> *I don't understand what the problem is with input data needing to be square.*

> *It seems to me your data *is* rectangular and should be easily divisible*

> *into squares.*

it seems that way, but it's not. the reason is that one of the data sets is of very coarse resolution and has been reprojected/regridded onto the finer resolution in order to do the comparison. further, the grid averaging uses nearest neighbor and the sensor in question has massive pixel overlap all of which leads to an __original__ coarse pixel (on coarse grid) that might look like this

```
-----  
||  
||____  
||  
|-----  
||  
-----
```

then this coarse grid is reprojected/regridded onto the fine grid so that this shape ends up looking the same to the eye, but being comprised of, say, 10000 pixels or more. this set of pixels in the fine grid originating from one coarse pixel set (representaon of one pixel in the coarse grid) we are calling the pixel 'footprint'. the reprojecting/regridding to fine res. step is merely to make determining the footprint an O(1) operation – it could be calculated on the fly of course...

the task then is to do an analysis of the coarse pixels using the reference data as 'truth'. so what is needed is to 'cut out' (mask) all the reference pixels from that footprint giving you a set of reference/fine pixels looking something like this

```
-----  
|...|  
|.x.|____  
|.xx...|  
|..x-----  
|x..|  
-----
```

where '.' is < 11 (not fireness) and 'x' is > 11 (fireness).

remember that the coarse pixel set at this point looks like

```
-----  
|nnn|  
|nnn|____  
|nnnnnn|  
|nnn-----  
|nnn|  
-----
```

a 'set' of pixels with all the same value since the set is merely a result of reproj/regrid. this is of no matter – we consider this set as one sensor pixel and then are doing a one to many (data to reference footprint) comparison.

the question is then: what set of factors in the reference (fine) data caused a detect in the test (coarse) data?

obviously we are looking at things like:

- how many total fine fire pixels where there
- what is there total brightness
- etc.

we also want some measure of clusteredness and here the problem starts:

all the code and translations of moran's index i've found work on a rectangular image region and i've got something like this

```
-----  
|...|  
|.x.|____  
|.xx...|  
|..x-----  
|x..|  
-----
```

i can clip it out and then stuff it into a minimum bounding box so that it's something like

```
-----  
|-----|  
||...| |  
||.x.|____|  
||.xx...||  
||.x-----|  
||x..| |  
|-----|  
-----
```

but then what to fill the missing values with. all the code i've read just isn't prepared to deal with the situation and the uses the fact that the data is rectangular when computing mean, weights, etc. bascially i need to create my own method where the input data is flat, but the weight function is aware of scanline adjacency (2dness).

my original post was asking if this has been done somewhere.

> *Also, what do you mean by cluster and clusteredness?*

we don't know. we are searching for a some measure that will give an indicator. i'm open to suggestion on the meaning of this.

my post is growing too long and so i'll stop here. hopefully i've clarified rather than confused. again, sorry i'm not able to describe the problem better – this problem is outside my normal domain.

kind regards.

–a

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=====  
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| When you do something, you should burn yourself completely, like a good  
| bonfire, leaving no trace of yourself. --Shunryu Suzuki  
=====
```