Subject: Algorithm for lat/lon searching
Posted by Paul Van Delst[1] on Fri, 18 Aug 2006 14:50:56 GMT
View Forum Message <> Reply to Message

Hello,

I want to implement a global *land* surface emissivity database (as a LUT) into a radiative transfer code. Fir simplicity the database is simply gridded by lat/lon (land and sea). Due to memory limitations, I want to only keep the land gridboxes in my lookup table. Obviously, doing this complicates searching for the actual lat/lon element since they're no longer stored on a grid.

What I'm looking for is a simple and/or quick method for searching a somewhat irregularly spaced database for particular points. In the IDL newsgroup there was recently a discussion above finding unique number pairs (lat->"high" portion of 64 bit int, lon->"low" portion) and I was thinking that would provide a searchable database. By converting the lat/lon pair to a unique number, e.g.

JD Smith wrote:
<IDL code follows>
> epsilon=1.e-7 ; difference in degrees for equality
> lat_lon = ulong64((lat+90.)/epsilon) + ishft(ulong64(lon/epsilon),32)

the resultant lat_lon array being simple to search.

An additional problem is that, since this data will be used for satellite data assimilation and satellites tend to scan "diagonally" across lat/lon, adjacent/close-by *geographical* grid elements will be accessed and it's not clear to me that the above lat/lon orgainisation will put elements separated by a short physical distance anywhere near each other in the lat_lon array.

I will be playing with and testing this over the coming days, but I wanted to pick the brains of folks out there in advance.

Thanks for any suggestions/advice,

cheers,

paulv

p.s. Since the final code needs to be Fortran95, I set followups to comp.lang.fortran

--
Paul van Delst Ride lots.
CIMSS @ NOAA/NCEP/EMC Eddy Merckx
Ph: (301)763-8000 x7748
Fax:(301)763-8545