Subject: Re: area enclosed by a poylgon on a sphere
Posted by Craig Markwardt on Tue, 03 Aug 1999 07:00:00 GMT
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Nick Bower <nick.bower@ssec.wisc.edu> writes:
>
>
>> I need to be able to find the area enclosed by an arbitrarily shaped
>> series of lat/lon points on the surface of the Earth. I have been told
>> that I can solve this using Green's Theorem, but before I gut through
>> the math I was hoping that someone would have solved this and be willing
>> to share the code. If it is already in IDL that would be great, but any
>> language will do.
>
> What does area in lat's and lon's mean? Since there is no unique
> "square lat/lon" area unit, you'd have to use a projection at some point
> I would guess. Don't have any code then for the area - always used
> ArcView for this type of thing. But maybe it's possible to project,
> pick a point inside a *convex* polygon, connect it with each vertex and
> find the summed area of triangles. You'd end up with an area, but it's
> specific to your spheroid/projection pair. Sorry if it's not what
> you're after, as there's a real chance you won't have a convex shape.

My guess is that he's after the area of the surface defined by the lat/lon points on the sphere (I assume boundary lines joining the points would be great circles). This is equivalent to finding the solid angle enclosed by the points.

There is a relatively simple formula involving a sum of vector cross products which compute the area of any planar polygon, so there must be an analogous form on the surface of a sphere. Unfortunately, it doesn't come to mind immediately.

Craig

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