Subject: Re: map_proj_* help
Posted by David Fanning on Mon, 08 Jun 2009 02:38:19 GMT
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Ken Mankoff writes:

> I began converting from using map_set to map_proj_* about a year ago.
> I've used it successfully in a few situations, but still frequently
> find myself wrestling with it and not getting small details to line
> up. Not that small details always line up with MAP_SET...

Well, I would say about 25% of the time, details not lining up probably has to do with limitations in IDL's map projection code. But probably 75% of the time, it has to do with not completely understanding map projections. I will say this, they are a LOT harder to understand than they appear to be. I've been doing map projection stuff of well over a year now, and just when I begin to think I really understand what I am doing, I find evidence to the contrary. (Maybe you have read some of my map articles. :-)

One reason your data may not line up is that the lat/lon values were produced with one datum, and you are doing the projection with another datum. (If you don't know what a datum is, the probability of getting things to line up goes down by another factor of five.) IDL does not really do datum shifts, and without them points can definitely be located in different places. (A "latitude" and a "longitude" are not the same thing as a "meter" or an "acre" and the point on the Earth they are meant to pinpoint depends on what datum you are using, and how that datum is oriented with respect to the center of the Earth.

But, all that said, that is usually not the problem. More often one of two things has happened. First, and considerably more likely in my experience, the published "corner" points are simply wrong. I don't know if it is because of typos or because undergraduates who know even less about map projections than you do are doing the calculations, but whatever it is, those numbers are frequently figments of someone's imagination.

The second thing that happens frequently is that you (perhaps naively, if you are not that familiar with map projections) simply assume that the center of the map projection must be located half way between the maximum and minimum latitude and longitude. Nothing is ever that simple on a map projection, believe me. :-)

So, typically, you have to spend several hours (or not infrequently, several days) tracking down information and confirming every single bit of it so you know *exactly* what you are doing. Then--and only if you have been living your life in an exemplary fashion--things line up like they are suppose to.

Am I discouraging you? I don't mean to. I'm just trying to point out that you haven't yet tried hard enough to figure it all out. There are lots of variables. Code, some of it written by the good folks at ITTVIS, is written incorrectly (and not fixed in updates of the software, but that is a topic better left for another time). There are no good maps (a joke) of the problem terrain.

Perhaps one good place to start is to read all of the map articles on my web page. There is a LOT of hard earned experience in those articles, believe me. If you understand everything you find there, I would say your are probably at least half way to your destination. Just grit your teeth and keep going. :-)

Cheers,

David

--
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.")
