
Subject: Re: UTM Map Projection Produces Incorrect Results
Posted by chris_torrence@NOSPAM on Tue, 01 Nov 2011 16:04:23 GMT
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Hello everyone,

First of all, the DATUM keyword was renamed to ELLIPSOID in IDL 7.1. IDL's map routines do not support true "datum" shifts, and so that keyword was poorly named. The DATUM keyword is still honored, and will behave identically to ELLIPSOID. The documentation for MAP_PROJ_INIT describes this change.

Second, there was a bug in the GCTP library: for the UTM projection it did not let you pass in arbitrary semimajor/semiminor axis values. Instead, you could only use one of the predefined 20 ellipsoids, which did not include WGS84. In the IDL documentation for MAP_PROJ_INIT, ellipsoids 0-19 would work fine, while 20-24 would just default to the Clark 1866 sphere. Now, ellipsoid #12 (Walbeck) is *identical* to WGS84, and will give you the *exact* same results as if you had used WGS84.

In IDL 8.2, this GCTP bug has been fixed, and you can now use all 25 predefined ellipsoids (including WGS84), as well as using your own semimajor/semiminor axes.

Third, in the !MAP structure, there is a !MAP.A and !MAP.E2 which should contain the semimajor and eccentricity(squared) values. If !MAP.E2 is zero, then you are using a spherical ellipsoid.

Fourth, we are always evaluating our libraries for IDL. The PROJ.4 or ESRI PE libraries are certainly an option, and we may consider upgrading to one of them in the future. However, the real reason to upgrade is not to improve existing map projections, but to gain access to new map projections, ellipsoids, and datum shifts. Nothing about the UTM projection is going to "get any better" between the GCTP and PROJ.4 libraries. The equations are still the same. Now, in this case, maybe we wouldn't have had this particular GCTP bug, but there are certainly some PROJ.4 bugs which we would inherit if we switched libraries.

Fifth, we are going to have a beta for IDL 8.2 in the next few weeks. If you are interested in testing out this fix, as well as trying out the new features, please contact Bill Okubo. He'll be posting a message shortly about the beta.

Thanks,
Chris Torrence
Exelis VIS
p.s. the name may have changed, but we're still the same people
