Subject: Discrepancy in map conversion between ENVI 4.6 and 5.0, where 4.6 appears more accurate

Posted by tom.grydeland on Thu, 02 May 2013 11:13:37 GMT

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Hello all,

I'm using some MODIS L3 data from NASA, and have discovered some problems with coordinate conversion in ENVI.

The MODIS data are in HDF format, in sinusoidal projection. The coordinate system is described at < URL:http://landweb.nascom.nasa.gov/developers/sn_tiles/sn_gr id.html >

To validate the coordinate transformation, I'm using tile h17v02 which covers most of Iceland. The day 2012-151 (2012-05-30) is nice and cloud-free for those who want to repeat the exercise.

From the metadata, I'm extracting the properties named UpperLeftPointMtrs and LowerRightMtrs, and sphere radius of 6371007.181 meters (which is what is defined for MODIS). The lower right point of this tile coincides with the upper left point of the next tile down and to the right, so these coordinates are the corners of the covered area, not the centrepoints of pixels.

The cornerpoints are:
  UpperLeftPointMtrs=(-1111950.519667,7783653.637667)
  LowerRightMtrs=(0.000000,6671703.118000)

The tile covers 2400 pixels in both directions, which means a pixel size of 463.313 metres in both directions.

I'm writing an ENVI file from the data in these HDF files (using no resampling or reprojection) with a header file that contains the following map/projection information:

map info = {ModisSinus, 1.500000000000, 1.500000000000, -1111718.863308736123, 7783421.981308735907, 463.312716527917, 463.312716527917, WGS-84, units=Meters}
projection info = {16, 6371007.2, 0.0000000, 0.0000000, 0.0000000, Sphere, ModisSinus, units=Meters}

(The reference pixel is (1.5, 1.5) since we need pixel centrepoint coordinates in our software.)

When opening the file in ENVI, I am able to identify the island of Vestmannaeyar, <URL:http://en.wikipedia.org/wiki/Vestmannaeyjar> which is large enough to show up, yet small enough to get a good reading of the coordinates. I use the "Cursor Location/Value" tool to look at the coordinates when placing the cursor over the middle of the island, pixel coordinates (225, 1578).

In ENVI 4.6, the coordinates reported are 63°25'35.14"N, 20°16'0.43"W which tallies well with the coordinates from Wikipedia or various mapping services.

In ENVI 5.0, for the same pixel coordinates, I get the coordinates 63°34'37.34"N,

20°17'47.22"W. A difference of 9 minutes N-S means more than 16 km distance.

I realise that "WGS-84" in map_info is incorrect, and I don't know whether "Sphere" in projection_info takes precedence, but I suspect this discrepancy is too great to be due to a datum error anyway.

Any clues?

--T