

Accuracy vs. Precision:

What You Need To Know for GIS

WHAT IS ACCURACY?

Accuracy is the degree to which information on a map matches true real-world values.

There are several types of accuracy:

- Positional
 - Horizontal
 - Vertical
- Attribute – how accurate are the attributes, or the data behind the spatial data?
- Logical Consistency – is the data consistent?
- Completeness – is the data complete?
- Lineage – where and with whom has the data been? What was done at each step of the data collection/analysis process?

HORIZONTAL ACCURACY

- The mapping standards employed by the United States Geological Survey specify that:
 - “For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale; for maps on publication scales of 1:20,000 or smaller, 1/50 inch.”
 - This means that when we see a point on a map we have its "probable" location within a certain area

WHAT IS PRECISION?

Precision refers to the level of measurement and exactness of description in a GIS database.

VERTICAL ACCURACY

- Vertical Accuracy Standard:
 - “Contour maps on all publication scales, shall be such that not more than 10% of the elevations tested shall be in error more than one-half the contour interval.”
- In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale
- For continuous attributes (surfaces) such as on a DEM or TIN:
 - Accuracy is expressed as measurement error
 - e.g. elevation accurate to 1 m

For more information, visit:
<http://giif.cnr.berkeley.edu>

