projections

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outline

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definitions

- projection: how 3D Earth is converted to 2D screen/map
- scale: the ratio of distance on a map to the same distance on the ground
- accuracy: data=real world (always some inaccuracy)
  - positional: how far off ?
  - consistency: is a house in data a real house ?
  - completeness: do we have all the houses in the database ?
- resolution (raster): pixel size

projections

- how 3D Earth is represented on 2D plane
  - there is always distortion
- many ways to do it
  - let's scroll through some examples

    `http://en.wikipedia.org/wiki/Map_projection`

reference

- http://www.qgistutorials.com/en/docs/working_with_projections.html
- http://maps.cga.harvard.edu/qgis/wkshop/proj.php
- http://www.peteraldhous.com/CAR/CAR2014_QGIS1.pdf [little complicated]

download data

- http://people.hmdc.harvard.edu/~akozaryn/myweb/tl_2012_us_state.zip
- http://people.hmdc.harvard.edu/~akozaryn/myweb/world_in_a_weird_projection.zip

what's that?

- it's about representing a 3D Earth (sphere) on a 2D screen (plane)
- it's always distorted in one way or another...
- importantly, it causes problems if layers are in different projections
- you load one–you see it; then load another one, and looks like it did not load
  - it did, zoom to layer extent, and you'll see it
- they don't overlap because they have different projections
  - `http://en.wikipedia.org/wiki/Map_projection`

an example...

- load tl_2012_us_state.shp
- then load ss.shp where is it? they overlap
- now disable OTF projection:
  - project-project properties-crs: *un*check enable on the fly CRS transformation
- ZOOM TO LAYER aha! it loaded but the projection is different
- note that the shape is different, e.g. Alaska !
- which one is right ?
- none !
- always when you project you distort...

what do we do ?

- just enable OTF (on the fly projection)
  - qgis will reproject to the current layer projection (from first imported layer)
- in some rare cases you may need to do it by hand...
  - do let me know if that happens and then we'll worry