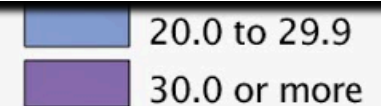


# QGIS TUTORIAL

Tutor: Tania Lopez-Cantu

Sponsored by the Environmental and Water Resources Institute Graduate Student Chapter at CMU

Source: Citylab (2011)



# What are geographic information systems software?

Framework for compiling, managing and analyzing data with spatial location.

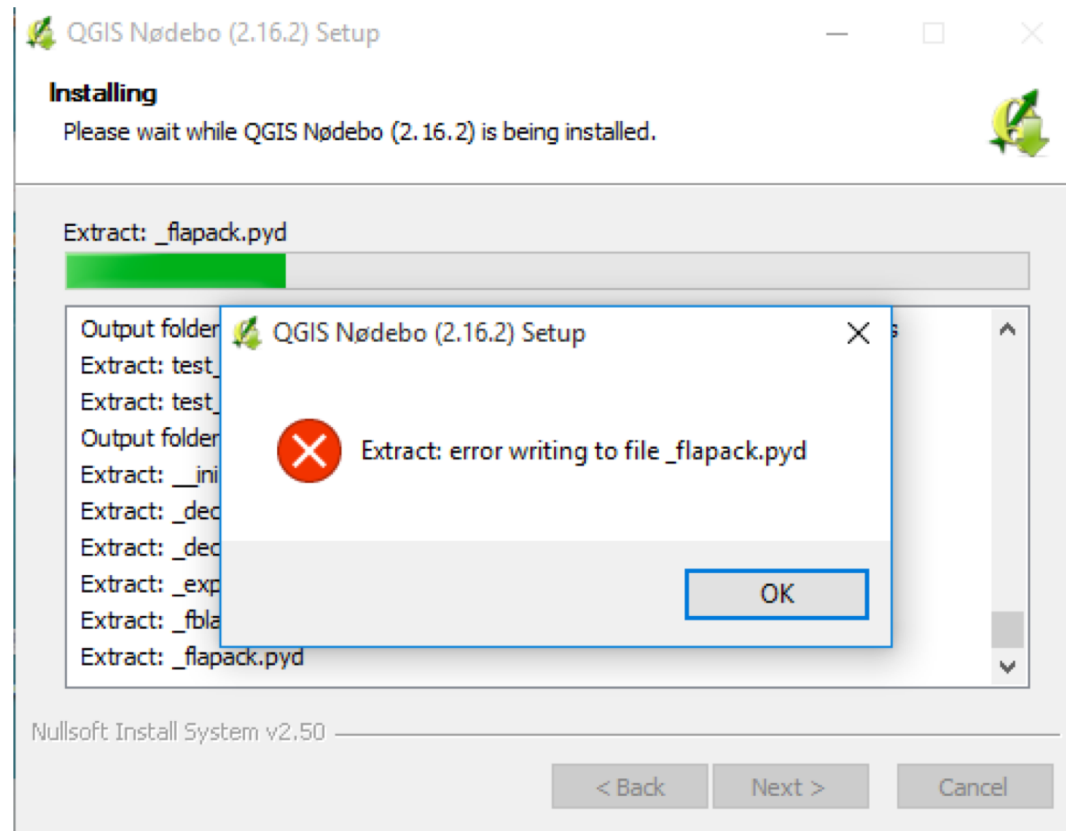


Source: BirdseyeviewGIS (2018), ESRI (2018)

# ArcGIS OR QGIS?

- Documentation
- Operating System Support
- Development
- Data Entry
- Plugins

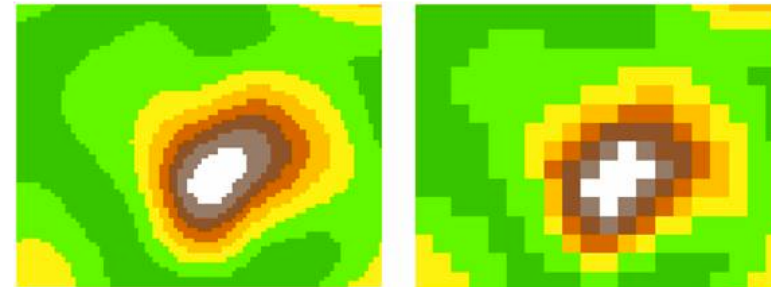
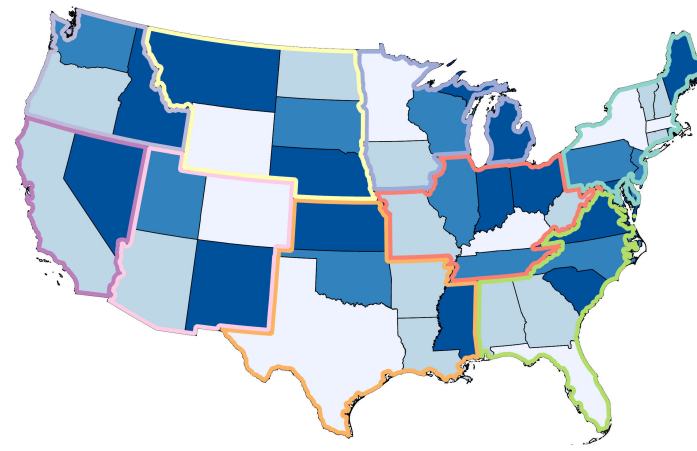
# Troubleshooting



Source: GIS StackExchange (2016), Percona (2016)

# There are two comprehensive data types, vector and raster data

- Vector data: representation of the world using points, lines, and polygons.
- Raster data: representation of the world as a surface divided into a regular grid of cells.



# Where can I obtain free official GIS data for my research?

- TIGER products from the US Census Bureau  
<https://www.census.gov/geo/maps-data/data/tiger.html?#>
  - State, County boundaries
  - Roads
  - Water features
  - Demographic and Economic Data
- For Pennsylvania:
  - Western Pennsylvania Regional Data Center <http://www.wprdc.org/>
    - Geography
    - Health
    - Environment
  - Pennsylvania Spatial Data Access (PASDA) <http://www.pasda.psu.edu/>

# Working with QGIS

## *Learning objectives*

- Become familiar to the QGIS user interface
- Become familiar with QGIS Plugins
- Learn to navigate through the interface (Workflow)
- Load data into the Map Canvas
- Symbolize maps (Thematic/Choropleth maps for qualitative and quantitative attributes)
- Create and import map as .jpeg or .pdf

# More advanced functions in QGIS

## *Learning objectives*

- Learn to filter data via the Attribute Table
- Learn to manipulate polygon shapefiles
- Join standalone tables to polygon data
- Load different other types of data in the Map Canvas
- Clip a raster layer
- Compute statistics within specific boundaries using the Zonal Statistics plugin
- Sample from raster using a point layer and the Point sampling tool