QGIS & GRASS: Do we need FOSS GIS?
FOSS-GIS
Outline

- Define FOSS-GIS
- Why consider FOSS-GIS?
- Background / history GRASS & QGIS
- Vector & Raster software function examples
  - use software to construct a map for visual analysis
  - computational query and then visual analysis
  - advanced computational spatial analysis
- Strengths / Deficiencies / Problems
- Conclusion / Recommendations / Summary
FOSS desktop GIS

SAGA
System for Automated Geoscientific Analyses

OPEN JUMP
Jump Unified Mapping Platform

Quantum GIS
Version 1.6.0
Copiapó

MAP WINDOW

uDig
User-friendly Desktop Internet GIS

OSSIM
“Awesome” Remote Sensing
ESRI GIS history

-early 1980s:
  ARC/INFO: command-line

-mid 1990s:
  ArcView: graphical user interface (GUI)

-late 1990s: Arc 8.x

-2010: Arc 10.0
Grass / Quantum GIS

-early 1980s:
  GRASS (Geographic Resources Analysis Support System)
  -US Army Construction Engineering Research Laboratory (CERL)
  -command-line

-mid 1990s:
  US Army CERL ended involvement with GRASS with 4.1

-late 1990s:
  GRASS 5.0 (GUI) with public license

-early 2000s:
  Quantum GIS began with some developers from GRASS

-2011: QGIS 1.6 & GRASS 6.4
GRASS & QGIS supported data formats

- Vector formats from **OGR library** including...
  - ESRI shapefiles, e00
  - AutoCad .dxf
  - MapInfo .mif, .tab
  - .gml
  - .kml

- Raster formats supported by **GDAL library** including...
  - USGS .dem
  - Erdas .img
  - .bmp, .gif, .jpg, .png, .tif
  - Arc/Info ASCII .asc
  - Grid .grd
QGIS Vector OGR file formats
QGIS Raster GDAL file formats
QGIS: usual Vector Tools (Victoria CMA: Avenues Rds Streets)
QGIS: usual Vector Tools (UVic campus)
Winnipeg 1971 CTs: % Households w/ Colour TV & Avg.Family Income
QGIS export to .kml (on GE)
Solution: Shp2kml (1971 Winnipeg: % Households Ukrainian origin)
QGIS: Create new shapefile
QGIS: Create new shapefile
ArcMap: Select by Attribute
ArcMap: Select by Attribute
QGIS: Select by Attribute
QGIS “Plug-Ins”
QGIS Plug-Ins: Georeferencer (UVic campus did not exist in 1954!)
QGIS: GDAL Raster tools
QGIS: Display .dem
QGIS: Assign Projection to .dem
QGIS: Projected .dem: Shadowing
(QGIS) GRASS: need to create directory of:
-Database
-Location
-MapSet
w/ Projection
AND then import the geo-spatial files
(QGIS) GRASS: Vector Analysis Tools
(QGIS) GRASS: Extensive Raster Analysis Tools
Hiking uphill with an 8 yr.old: Least Cost Route
QGIS: Web Map Service (WMS)
WMS: BC Terrain Resource Information Management (TRIM): Whistler, BC
WMS: DFO Canadian Hydrographic Service (CHS) Charts
Web Feature Services (WFS) geo-spatial data: Connect to the data
QGIS Map Composer
ArcMap 10: Bing Hybrid Layer
QGIS 1.6 OpenLayers Plug-in: Google Hybrid layer
ArcMap 10: Bing Maps Hybrid (Miranda, Brasil)
QGIS 1.6: Google Maps Hybrid (Miranda, Brasil)
Conclusion / Recommendations / Summary

“The change to open source requires a different mindset. Rather than one program or one suite of programs delivering everything you need, you go over to different programs that all communicate with each other and use the same (standard) protocols and data formats.”

- Respond and recommend according to the needs of our students
  - Geography
  - Anthropology
  - Biology
  - Business

...they all have different needs...
“As adopters of open source technology, academic libraries should consider adding FOSS GIS and becoming involved with the open source movement. GIS and data librarians are in a unique position as they gain familiarity with several applications of GIS under many circumstances, since they have patrons from many different fields whose needs for GIS range from basic to advanced.” (Donnelly, 2010)
Geo-Spatial Data Sources

Bird Studies Canada. *Bird Studies WFS*.

British Columbia. Ministry of Forests and Range. *Vegetation Resources Inventory*.

Canada Department of Fisheries & Oceans. *GeoPortal WMS*.

Natural Resources Canada. *Canadian Digital Elevation Data*. 062H/14e, 82O/04e

Natural Resources Canada. *CanVec & National Topographic Data Base*. 92B/11


Selected Sources


