Comparing Arc GIS and GRASS GIS

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May 2013
Outline

Introduction to Arc GIS and GRASS GIS
Pros and Cons
My current research
Results from GRASS GIS
Ranking ArcGIS and GRASS GIS
History of Arc GIS (geographic information system)

History of Software Development
• Developer: ESRI - Environmental Systems Research Institute
• ArcInfo (1982)
• ArcView (1990’s)
• ArcGIS (2000’s)
• Latest version is 10.1 (June 2012)

ArcGIS for Desktop is licensed under three functionality levels:
1- ArcGIS for Desktop Basic (known as Arc View), allows one to view spatial data, create layered maps, and perform basic spatial analysis
2- ArcGIS for Desktop Standard (known as Arc Editor) includes more advanced tools for manipulation of shapefiles and geodatabases
3- ArcGIS for Desktop Advanced (known as ArcInfo), which includes capabilities for data manipulation, editing, and analysis
History of Grass GIS (Geographic Resource Analysis Support System)

- GRASS GIS (Geographic Resources Analysis Support System) is a free Geographic Information System (GIS) software used for geospatial data management and analysis, image processing, graphics, maps production, spatial modeling, and visualization.

- Development of GRASS GIS in 1982 by United States Army Construction Engineering Research Laboratory (CERL) in order to support land management at U.S. military installations.

GRASS is currently available for UNIX, Linux, or a Windows port program called Cygwin, which emulates a Linux environment on a Windows Operating System.

- Currently used in academic and commercial settings governmental agencies and environmental Consulting companies around the world.

- Latest version: GRASS 6.4.2

Downloading Grass GIS: http://grass.osgeo.org/
GRASS GIS tutorial: http://grass.osgeo.org/documentation/tutorials/
Screenshots of the GRASS GIS user interface
Pros and Cons

**Installation**
Arc GIS installation is easier than GRASS

**Cost**:
GRASS GIS is free while Arc GIS is a bit costly (depends on user need)

**Training and Technical Support**
more tutorial and Forum available for Arc GIS than GRASS GIS

**Database Creation**
accessing and storing spatial data with ArcGIS is straightforward
the GRASS database does not allow the user as much freedom in working with geo-spatial data, needs defining a specific Location with a specific analysis area (region) and specific projection

**Data Import and export**:
Data import for both are straightforward, a little bit problem in Arc GIS to export raster data

**Image classification**
Image processing with Arc GIS needs Envi, although we can use raster calculator to the some basic analysis
GRASS offers all the tools necessary for an image classification analysis

**Map Layout Capabilities**:
ArcGIS offers many styles of built-in compass arrows, legends, scales, text, and borders
GRASS does not offer useful tools for map design and layout
My experience

- Using RHESSys model, need input map
- GRASS
- Defining GRASS location
  - Define GRASS database and location
  - Define coordinate system
  - Define projection
  - Define Datum, projection zone

To bring DEM:
- Set the region
- Use command line or GRASS toolbox to open DEM
- Using command line to create other maps based on DEM
- GIS
- Like what we did on Lab#10 (using slope, aspect, watershed tool)
Maps created in GRASS

Set the region:
g.region rast=dem
r.in.arc input=dem30m output=dem30m nv=0

r.Watershed t=1000 el=dem30m dtrain=drain stream=str.t1000
r.slope.aspect el=dem30m slope=slope aspect=aspect
## Ranking Arc GIS VS GRASS GIS (1-5)

1: poor  
3: average  
5: good

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<th>Category</th>
<th>Arc GIS</th>
<th>GRASS GIS</th>
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<td>Training and Technical Support</td>
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<td>Cost</td>
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<td>Database Creation</td>
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<td>Data Import and Export</td>
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<td>Image classification</td>
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<td>Map Layout Capabilities</td>
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References

- Buchanan, T.R. Hardin, B.S. Simmons University, COMPARISON OF GEOGRAPHIC INFORMATION SYSTEM
- GRASS GIS, http://grass.osgeo.org/