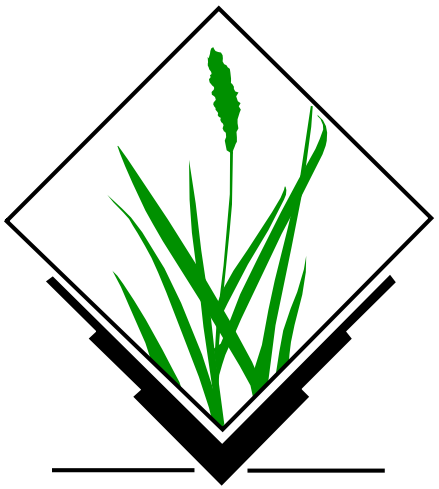
Graphical User Interface for composing hardcopy map outputs in GRASS GIS

Anna Kratochvílová

Czech Technical University in Prague
Faculty of Civil Engineering



Contents

Basic information about this project:

- realized within bachelor thesis
- mentor Ing. Martin Landa
- development started in January
- now available in GRASS AddOns

Project motivation

GRASS GIS—tool intended for data analysis, not for cartography

$\Longrightarrow$ unsatisfactory situation in creating map outputs

Module *ps.map*

- specialized tool for creating hardcopy maps
- input—text file with mapping instructions
- output—PostScript format

Using ps.map

ps.map—not easy to use:

- knowledge of the names of instructions and their usage
- inconvenient determining of object's position on paper (pencil, paper and calculator are often needed)
- takes time to get the intended result

Mapping instructions

- about 30 instructions
- most instructions have a few subcommands

Simple example

```
paper a4
    end
raster aspect
vlines streams
    width 1
    color 0:0:255
    end
end
```

ps.map functionality

Basic elements used in cartographic output

- raster, vector layers
- map legend (raster and vectors separately)
- scale bar
- text
- grid
- points, lines, rectangles
- EPS images

ps.map inconveniences

- only one raster layer
- numeric scale only within mapinfo
- some accented characters not supported (encoding Latin1)
- inconsistencies in used coordinates systems, reference points
- named colors × RGB (partly solved)

GUI for ps.map

- Map composing with ps.map is not comfortable enough
- GUI is needed

  $\Rightarrow$ *Hardcopy Map Output Utility* (also called *wx.psmap*)

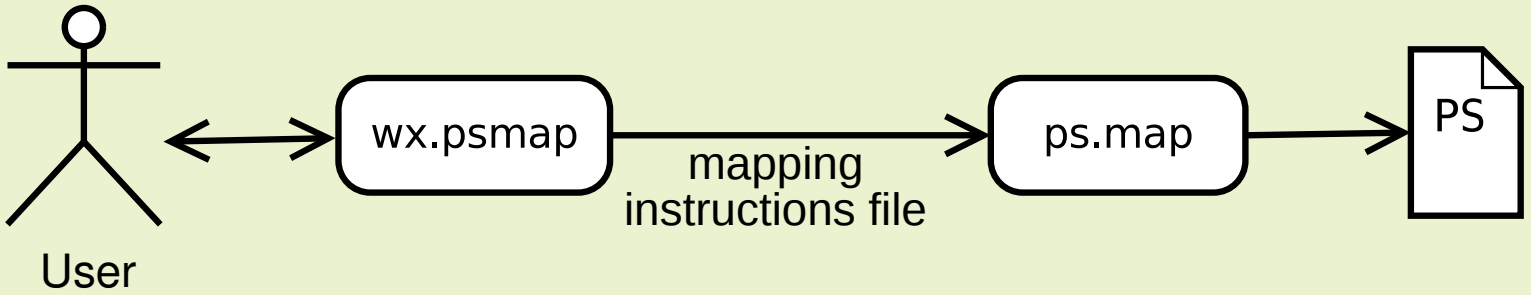
Main advantages

- interactive positioning of map elements
- no need to know ps.map instructions
- preview of result

$\Rightarrow$ makes the map composing easier and faster

Implementation basics

Basic schema



Programming language, library

- programming language *Python*
- GUI toolkit *wxPython*

wx.psmap possibilities

- wx.psmap supports major part of ps.map instructions (and the most important)
  - raster and vector layers
  - map legend (raster and vector)
  - scale bar, text
  - map info (scale, extent)

wx.psmap possibilities

- wx.psmap makes map composing more comfortable
  - zoom, pan
  - preview of result
  - ability to read configuration file
  - region is set internally
  - output formats:
    - PS
    - PDF (if ps2pdf is available)
    - configuration file with basic info in header

Region in wx.psmap

- ps.map draws data from current region (set via *g.region*)
- wx.psmap sets region internally (doesn't affect current region)
- several options:
  - match raster/vector map extent
  - use named region
  - use current region
  - region computed from map center and scale
- region settings are written in configuration file as a comment
- this comment is used when reading configuration file

Draft & Preview mode

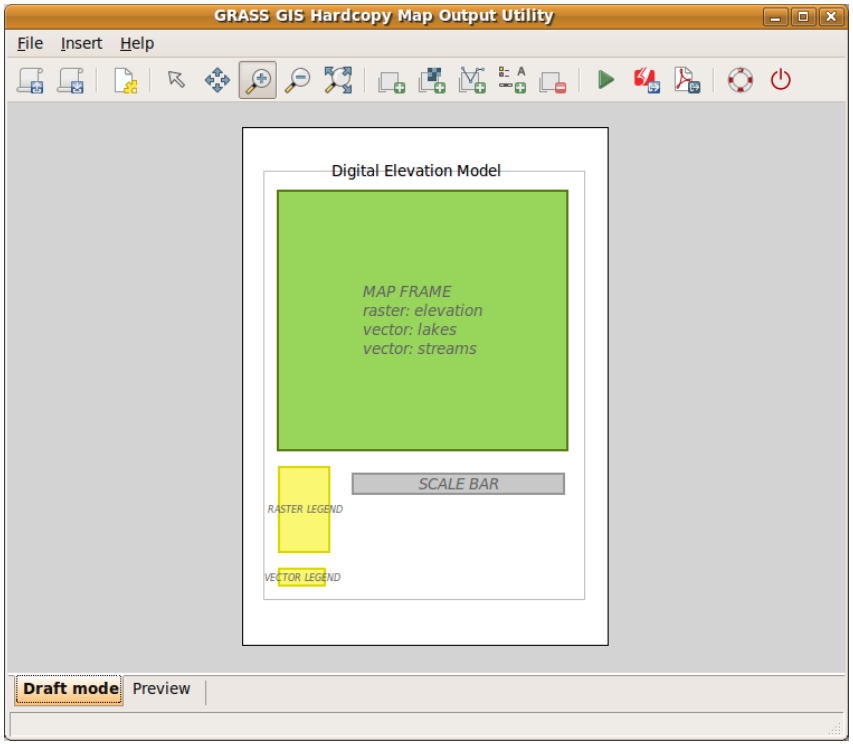
Draft mode

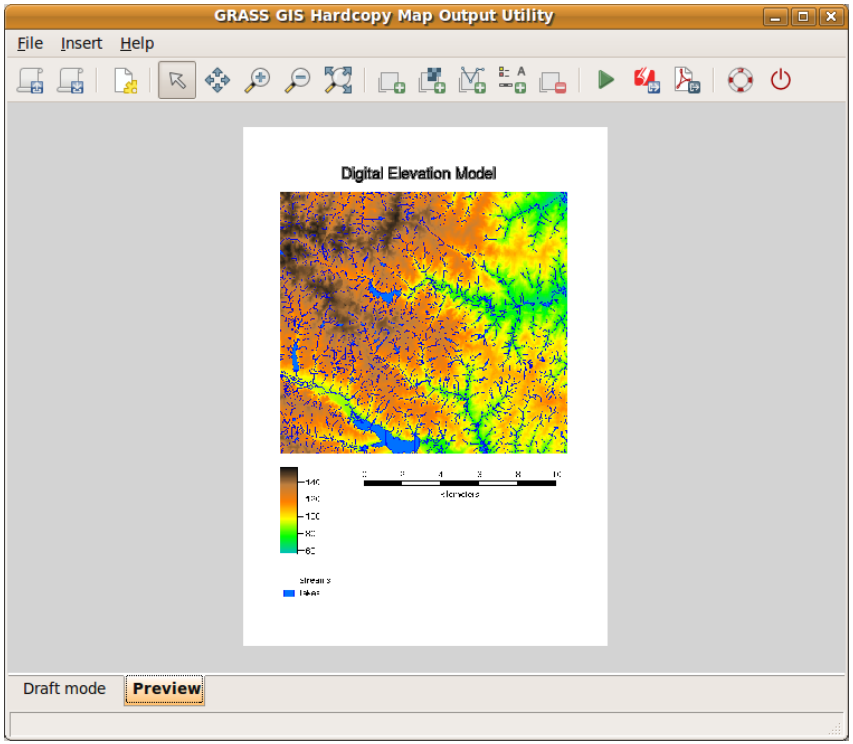
- for composing map output interactively
- map elements are represented by colored rectangles

Preview mode

- preview of result (lowered quality)
- non-interactive mode

Draft & Preview mode





Limitations

- wx.psmap is limited by ps.map's functionality and interface

Consequences

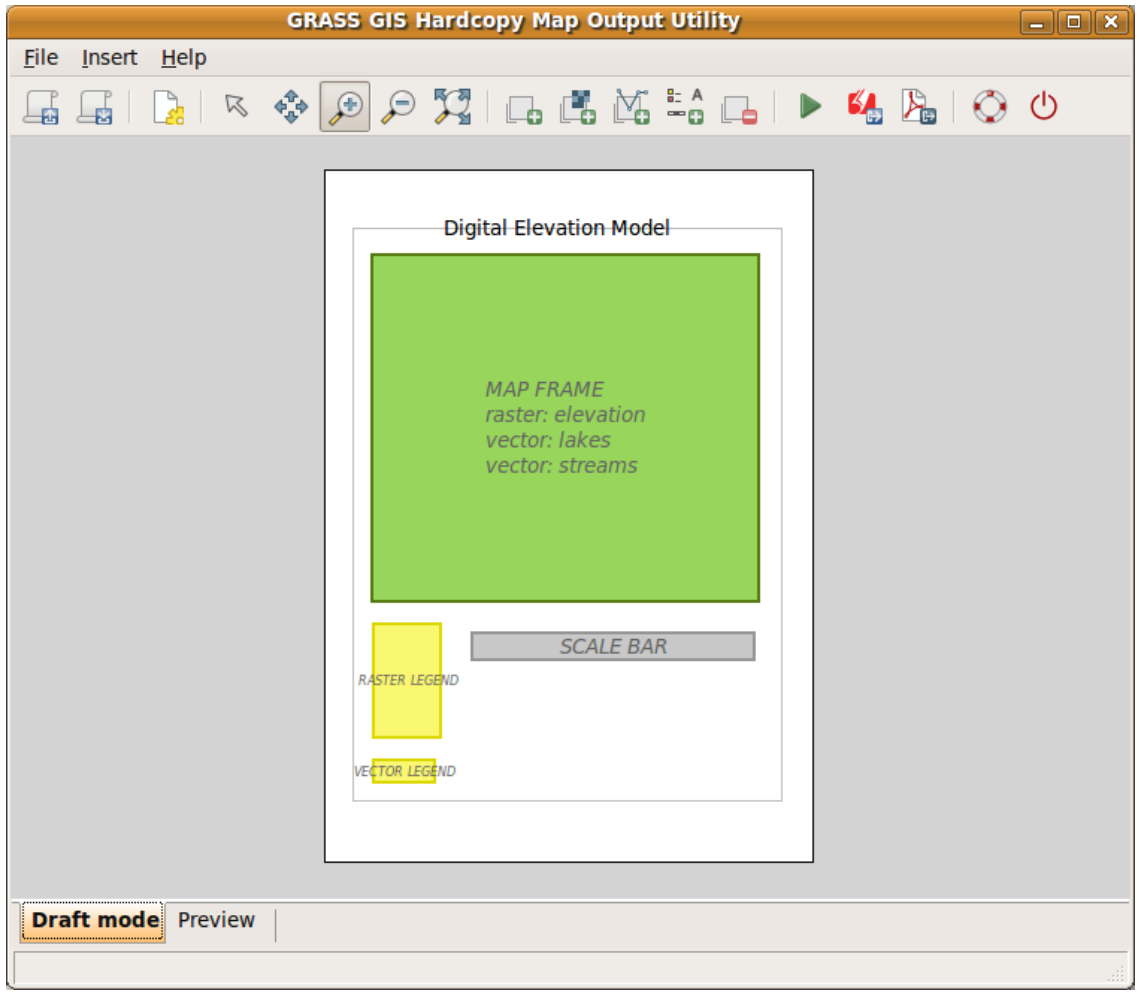
- inaccurate size of map elements in draft mode (depends on font size and other parameters)
- resizing of map elements is not supported (except for map frame)

Video demonstration of wx.psmap

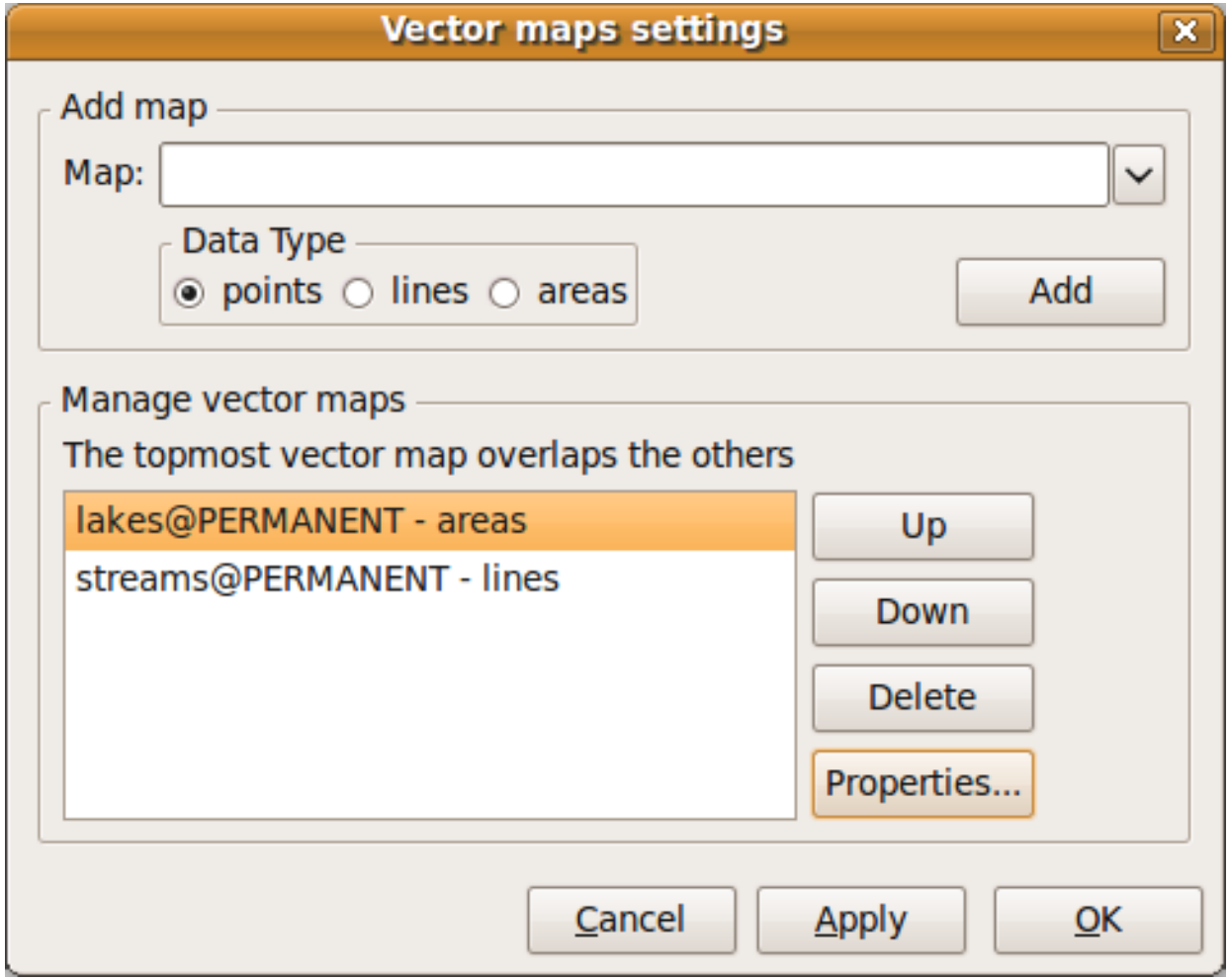
- Basics
- Adding map elements
- Result

▸ Conclusion

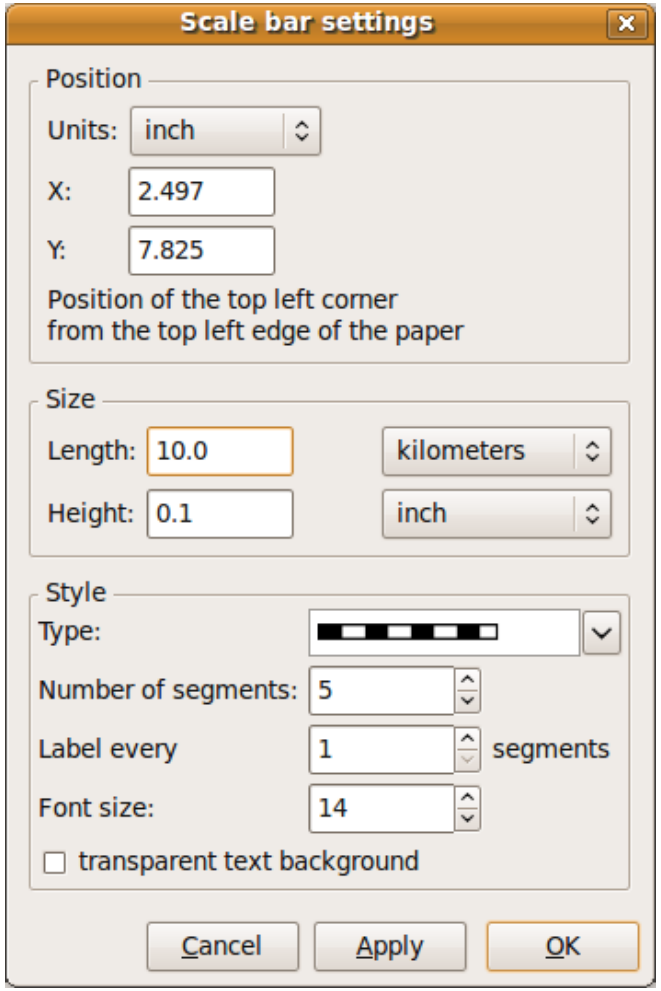
Draft mode


GRASS GIS Hardcopy Map Output Utility
File Insert Help
Digital Elevation Model
MAP FRAME
raster: elevation
vector: lakes
vector: streams
SCALE BAR
RASTER LEGEND
VECTOR LEGEND
Draft mode
Preview

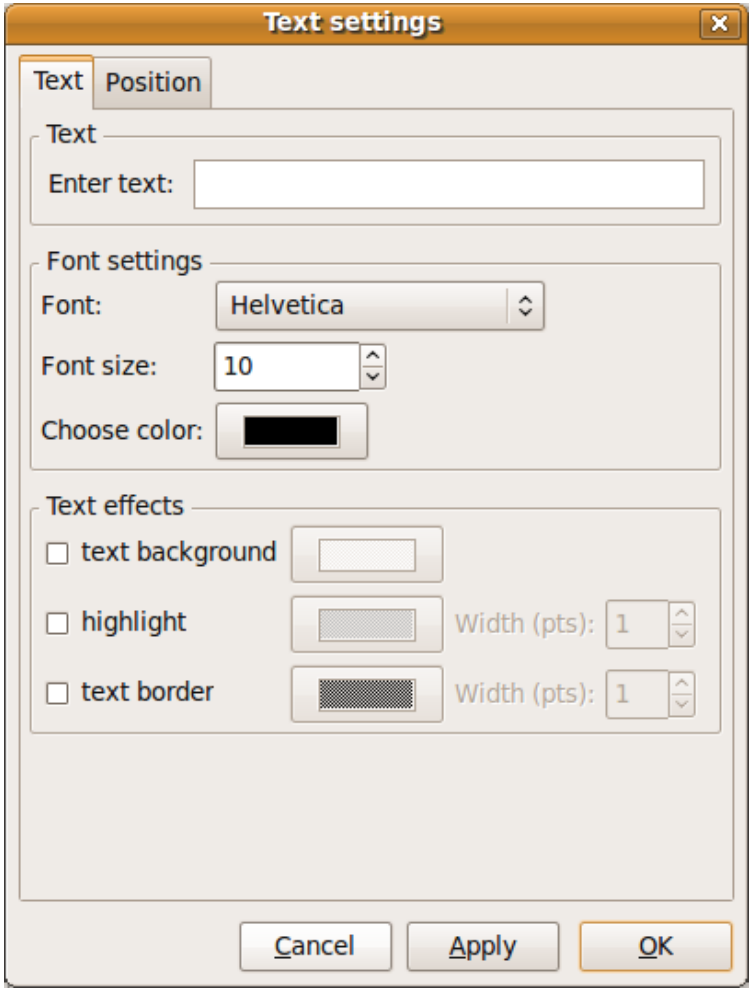
Dialog window—vector layers



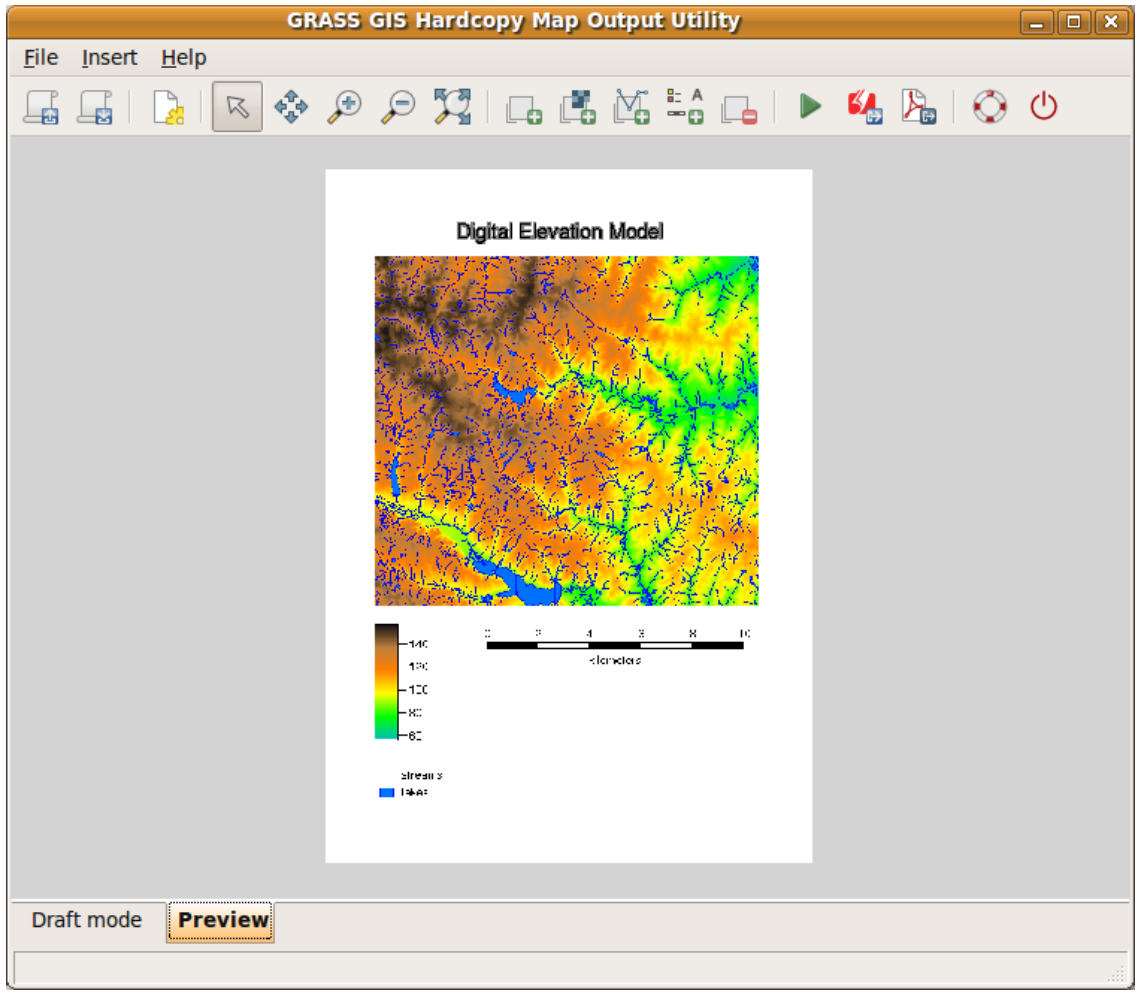
Dialog window—scale bar



Dialog window—text



Preview


GRASS GIS Hardcopy Map Output Utility
File Insert Help
Digital Elevation Model
Draft mode
Preview

Conclusion

- wx.psmap is available in GRASS AddOns
- wx.psmap is planned to be the part of GRASS GIS 6.4.2
- it is intended to continue with the development (support instructions like grid or eps)