

Introducere în GRASS

Ionut OVEJANU

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TIMISOARA, 20.11.2010

Structura prezentarii



1. Introducere in GRASS GIS

2. Operare in GRASS GIS





I N T R O D U C E R E G R A S S G I S





Ce este GRASS?

GRASS = IARBA

IARBA, IERBURI, [substantiv feminin] = Nume generic dat plantelor erbacee, anuale sau perene, cu partile aeriene verzi, subtiri si mladioase, folosite pentru hrana animalelor.

GRASS GIS (**G**eographic **R**esources **A**nalysis **S**upport **S**ystem),
un **S**ystem **I**nformational **G**eografic (GIS).
Acesta este disponibil sub GNU **G**eneral **P**ublic **L**icense (GPL).

Este o parte din familia proiectelor **OSGeo**





De unde vine GRASS?

GRASS a fost inițial dezvoltat la începutul anului 1980 de către **US Army Construction Engineering Research Laboratories (USA-CERL)** și a fost distribuit ca un software public.

GRASS a fost în dezvoltare continuă din anul 1982 (a fost distribuit publicului în 1989, dar a avut o răspândire mare odată cu apariția Internetului în anul 90).

GRASS a implicat un număr mare de agenții federale din SUA, universități și companii private: NASA, NOAA, USDA, National Park Service, SUA Census Bureau, USGS.

USA-CERL s-a implicat în dezvoltarea GRASS până la versiunea 4.1 în 1992, au adăugat cinci patch-uri diferite și actualizări și a scris și componentele de bază ale GRASS 5.0 (1995)

Din 1997, proiectul a fost realizat de **Grupul de Cercetare GRASS** de Universitatea Baylor, Waco (Texas), S.U.A. care a lansat versiunea 4.2 și, împreună cu alte organisme de dezvoltare, GRASS s-a actualizat și a fost detectată de către un grup de cercetători de la Universitatea Hanovra condus de **Markus Neteler** care a supervizat dezvoltarea versiunii 5 și a următoarelor.





De unde vine GRASS?

În perioada 1998-2001, **GRASS** a fost găzduit la Universitatea din Hanovra, Germania.

În perioada 2001-2007, **GRASS** a fost găzduit la ITC-IRST, Trento, Italia.

GRASS este dezvoltat de o rețea mondială de dezvoltatori care continuă să lanseze în mod regulat noi versiuni.

Din 2008 site-ul web principal, GRASS mailing list-uri ale dezvoltatorilor și alte listele suplimentare de discuții sunt găzduite la **Fundatia OSGeo** în SUA.

Codul sursă este menținut într-un server SVN (Apache Subversion).
Proiectul GRASS este sprijinit de numeroase site-uri mirror.

Apache Subversion (SVN abreviat, după numele comenzii „svn”) management al versiunilor de software și un sistem de control și revizuire fondat și sponsorizat în anul 2000 de către **CollabNet Inc.** Acesta menține versiunile curente și istorice de fișiere, cum ar fi codul sursă, pagini web, și documentație.



Promotorii GRASS

Markus Neteler - Germania

2005 – 2010 PHD Spatio-temporal reconstruction of satellite-based temperature maps and their application to the prediction of tick and mosquito disease vector distribution in Northern Italy - University of Hannover (Germany)

Oct. 1993 - March 1999, DIPLOM-GEOGRAPH (Degree in Physical Geography and Landscape Ecology) UNIVERSITY OF HANNOVER

Oct. 1990 - Oct. 1993 UNIVERSITY OF HANNOVER, B.Sc. in Electrical Engineering ("Vordiplom")



Helena Mitashova - Slovacia

2008 – present: Associate Professor, Department of Marine, Earth and Atmospheric Sciences (MEAS), North Carolina State University (NCSU), Raleigh

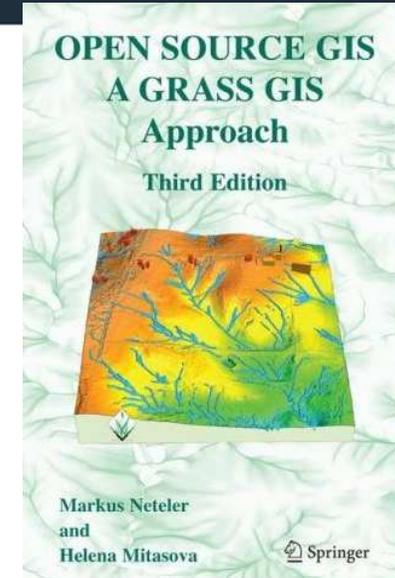
1987 Ph.D. in Geodesy and Cartography, College of Civil Engineering, Slovak Technical University, Bratislava, Czechoslovakia

1981 M.S. (dipl. Ing) in Geodesy and Cartography, College of Civil Engineering, Slovak Technical University with the Highest Scholastic Honors, Bratislava, Czechoslovakia



Bibliografie GRASS

Markus Neteler and Helena Mitsova, 2008,
Open Source GIS: A GRASS GIS Approach. Third Edition.
Springer, New York



GRASS GIS 6.0 Tutorial, 2005 Version 1.2 -
GDF Hannover



Căutare Google

Mă simt norocos



De unde obtin GRASS?

Site oficial:

<http://grass.osgeo.org/>

Mirror:

<http://grass.unibuc.ro/index.php>

European mirrors HTTP:

- [Finland](#) (Tier 1)
- [France](#) (Tier 1, CICT - Université de Toulouse)
- [Germany](#) (Tier 1, Univ. of Hannover)
- [Germany](#) (Tier 1, Netmirror)
- [Italy](#) (Tier 1)
- [Russia](#) (Tier 1, gis-lab.info)
- [Slovakia](#) (Tier 1)
- [Bulgaria](#) (Tier 2, Sofia University)
- [Croatia](#) (Tier 2, FER)
- [Germany](#) (Tier 2, ZdG GmbH)
- [France](#) (Tier 2, Univ. of Bourgogne)
- [France](#) (Tier 2, ZdG GmbH)
- [Germany](#) (Tier 2, Univ. of Duisburg)
- [Germany](#) (Tier 2, online-mirror.de)
- [Germany](#) (Tier 2, very-clever.com)
- [Italy](#) (Tier 2, Univ. of Parma)
- [Italy](#) (Tier 2, ominiverdi.org)
- [Poland](#) (Tier 2, Wroclaw Univ.)
- [Poland](#) (Tier 2, Cracow)
- [Romania](#) (Tier 2, Univ. of Bucharest)
- [Slovakia](#) (Tier 2, Prime Interactive Ltd.)
- [Turkey](#) (Tier 2, Istanbul Teknik Üniversitesi)



GRASS GIS - The World Leading Free Software GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

<http://grass.unibuc.ro/index.php>

OpenGIS.UniBuc.ro

GRASS GIS - The World Leading...

Welcome to GRASS GIS

You are at a GRASS mirror site in ROMANIA (RO) (other [mirror sites](#))
This site is updated daily: 31 Oct 2010

[Intro](#) [Docs](#) [Download](#) [Community](#) [Applications](#) [Development](#) [Sponsors](#)

Search

Advanced search

[About GRASS](#)

[Screenshots](#)

[Download](#)

[Wiki](#) - help site | [FAQ](#)

[Mirror sites](#)

[Mailing lists](#) | [IRC](#)

[Translating](#)

[Newsletter](#)

[Get involved!](#)

[GRASS in the Press](#)

[Bug/Feature trackers](#)

Donate

**OPEN SOURCE GIS:
A GRASS GIS
Approach
Third Edition**

Celebrating 27 years!

GRASS User map (without pop-up)

Geographic Resources Analysis Support System

Commonly referred to as GRASS, this is free Geographic Information System (GIS) software used for geospatial data management and analysis, image processing, graphics/maps production, spatial modeling, and visualization. GRASS is currently used in academic and commercial settings around the world, as well as by many governmental agencies and environmental consulting companies. GRASS is an official project of the [Open Source Geospatial Foundation](#).

Module of the day:
[v.lrs.where](#) Finds line id and real km+offset for given points in vector map using linear reference system.

Done

De unde obtin GRASS?

GRASS - USB

- [slaxGIS](#): All in one USB stick!
- [FOSSGIS on USB Stick](#): All in one USB stick!

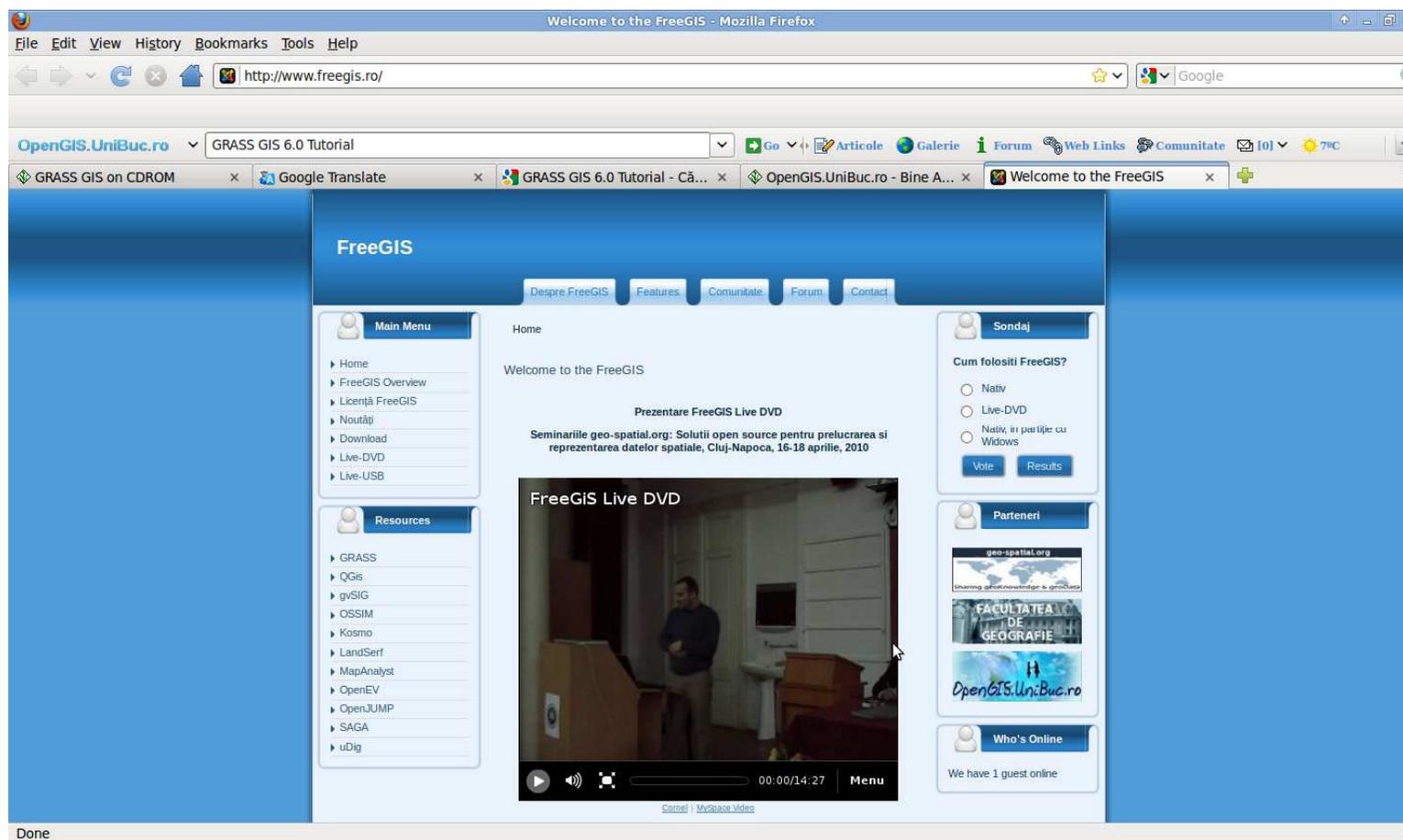
GRASS – CD/DVD

- [ArcheOS](#): The first GNU/Linux distribution for archaeology ([screenshots](#))
- [DebianGIS Live Image](#) - (development project)
- [FOSS4G Toolkit CD](#) - includes FOSS4G tools such as GRASS-GIS, MapServer, GDAL, OSSIM, QGIS, PostGIS, Mapbuilder, Mapbender, Cartoweb, Appformap, kaMap, Worldkit, Plone, PrimaGIS, and many other FOSS4G tools.
- [FOSS4G2006](#): Lausanne/Switzerland GRASS Workshop LiveCD 2006
- [FOSS4G 2008 live Workshop DVD](#): conference workshop "Practical Introduction to GRASS and related software for beginners" Workshop. The DVD is based on Kubuntu.
- [geobuntu](#): Xubuntu based LiveCD with latest and greatest FOSSGIS tools
- [GISAK](#) - Knoppix based GIS LiveCD
- [Italian GRASS DVD](#): Italian Kubuntu/The Open CD derivate with GRASS 6 and QGIS + data + tutorials (the DVD also contains GFOSS software for MS-Windows)
- [Ominiverdi LiveCD Project](#): Installable LiveCD with GRASS, QGIS, R, PostGIS, sample data and much more Latest update
- [OSGeo Live GIS Disc](#) - The Live DVD contains a collection of the best Geospatial Open Source software, pre-configured with sample data.
- [Poseidon Linux](#): It contains GRASS, GMT and QGIS (all packages maintained by DebianGIS) as well as SPRING GIS, Terraview, R, Octave, MB-System, OpenDX, Lyx, Kile, Vis5D, etc.
- [SOURCEPOLE GIS Knoppix](#): GRASS, UMN MapServer, MapLab



De unde obtin GRASS?

GRASS – FreeGIS Live DVD



FreeGIS

Despre FreeGIS Features Comunitate Forum Contact

Main Menu

- Home
- FreeGIS Overview
- Licență FreeGIS
- Noutăți
- Download
- Live-DVD
- Live-USB

Resources

- GRASS
- QGIS
- gvSIG
- OSSIM
- Kosmo
- LandSerf
- MapAnalyst
- OpenEV
- OpenJUMP
- SAGA
- uDig

Home

Welcome to the FreeGIS

Prezentare FreeGIS Live DVD

Seminariile geo-spatial.org: Solutii open source pentru prelucrarea si reprezentarea datelor spatiale, Cluj-Napoca, 16-18 aprilie, 2010

FreeGIS Live DVD

00:00/14:27 Menu

Sondaj

Cum folositi FreeGIS?

Nativ

Live-DVD

Nativ, in partitii cu Widows

Vote Results

Parteneri

geo-spatial.org

FACULTATEA DE GEGRAFIE

OpenGIS.UniBuc.ro

Who's Online

We have 1 guest online



<http://www.freegis.ro>



Câte versiuni de GRASS sunt?

GRASS 6.4.0

S T A B L E	GRASS 6.4.0 (stable version; new wxPython GUI, more...) Most users will want to install this version.		
	<i>Binaries</i>	<i>Source code</i>	<i>Manuals</i>
	<ul style="list-style-type: none"> 🐧 GNU/Linux: <ul style="list-style-type: none"> • Debian • Mandriva (urpmi grass) • OpenSUSE (Geo Repo) • Red Hat Enterprise Linux (RHEL, CentOS and Scientific Linux) • Ubuntu (9.04, 9.10, 10.04) • Generic weekly snapshot 🍏 Mac OSX 🪟 MS-Windows 	<ul style="list-style-type: none"> • grass-6.4.0.tar.gz (md5sum) • Weekly 6.4-svn snapshot • Download latest 6.4-svn code • 6.4-svn source code browser 	<ul style="list-style-type: none"> • User manual pages • Programmer's Manual • Compiling source code

GRASS 6.5

	GRASS 6.5 (restricted development; testbed for backporting, more...) Utility version for developers.		
	<i>Binaries</i>	<i>Source code</i>	<i>Manuals</i>
	Weekly snapshot: 🐧 Generic GNU/Linux Daily snapshot: 🪟 MS-Windows	<ul style="list-style-type: none"> • Weekly 6.5-svn snapshot • Download latest 6.5-svn code • 6.5-svn source code browser 	<ul style="list-style-type: none"> • User manual pages • Programmer's Manual • Compiling source code



Câte versiuni de GRASS sunt?

GRASS 7

NEW	GRASS 7 (active development version; partial rewrite, more...) Unstable and experimental, but usually works. Compatibility with earlier versions is not guaranteed.		
	Binaries	Source code	Manuals
DEVELOP	Weekly snapshot:  Generic GNU/Linux	<ul style="list-style-type: none">• Weekly 7.0-svn snapshot• Download latest 7.0-svn code• 7.0-svn source code browser	<ul style="list-style-type: none">• User manual pages• Programmer's Manual• Compiling source code
	Daily snapshot:  MS-Windows		



Ce face GRASS?



- ✓ Operare pe platforme LINUX, Windows, Mac OsX
- ✓ Interoperabilitate cu standardele raster si vector
- ✓ Analiza vector 2D/3D
- ✓ Analiza raster 2D/3D
- ✓ Procesarea imaginilor
- ✓ Vizualizarea hartilor in format 2D/3D



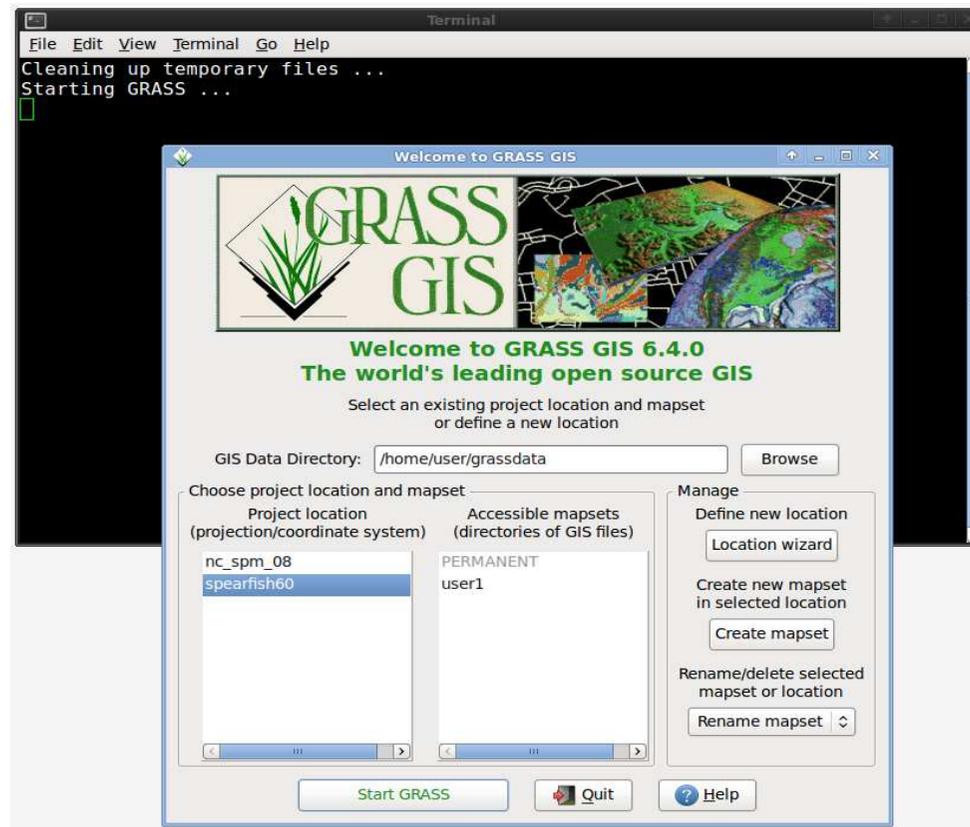


OPERARE GRASS GIS



Pornire GRASS

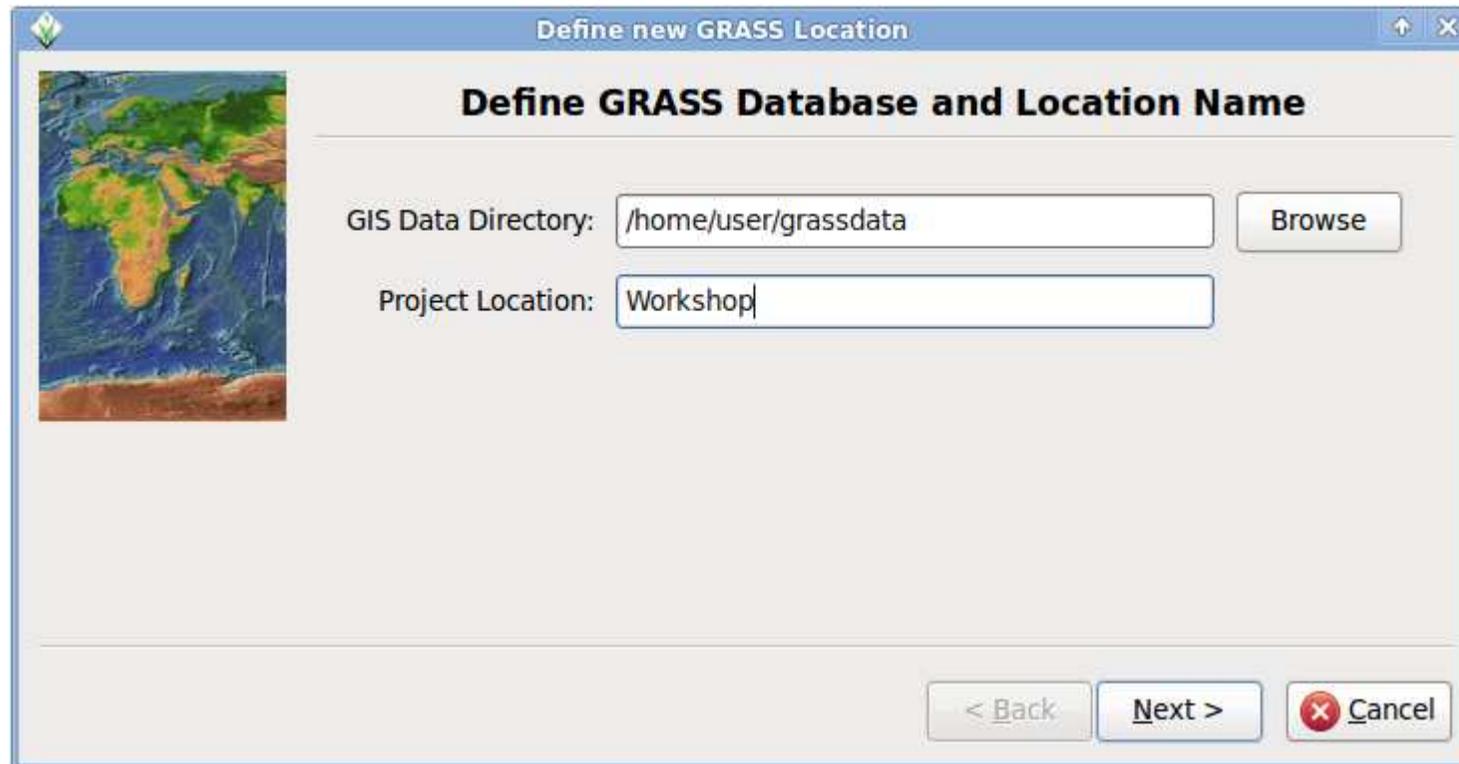
1. Executam in terminal comanda: `grass -wxpython`
- 1'. Executam in terminal comanda: `grass -tcltk`
2. Accesam Applications>Education>GRASS GIS



wxGUI este noua interfața a GRASS GIS.
Este succesoarea interfeței Tcl/Tk GUI din GRASS 6.

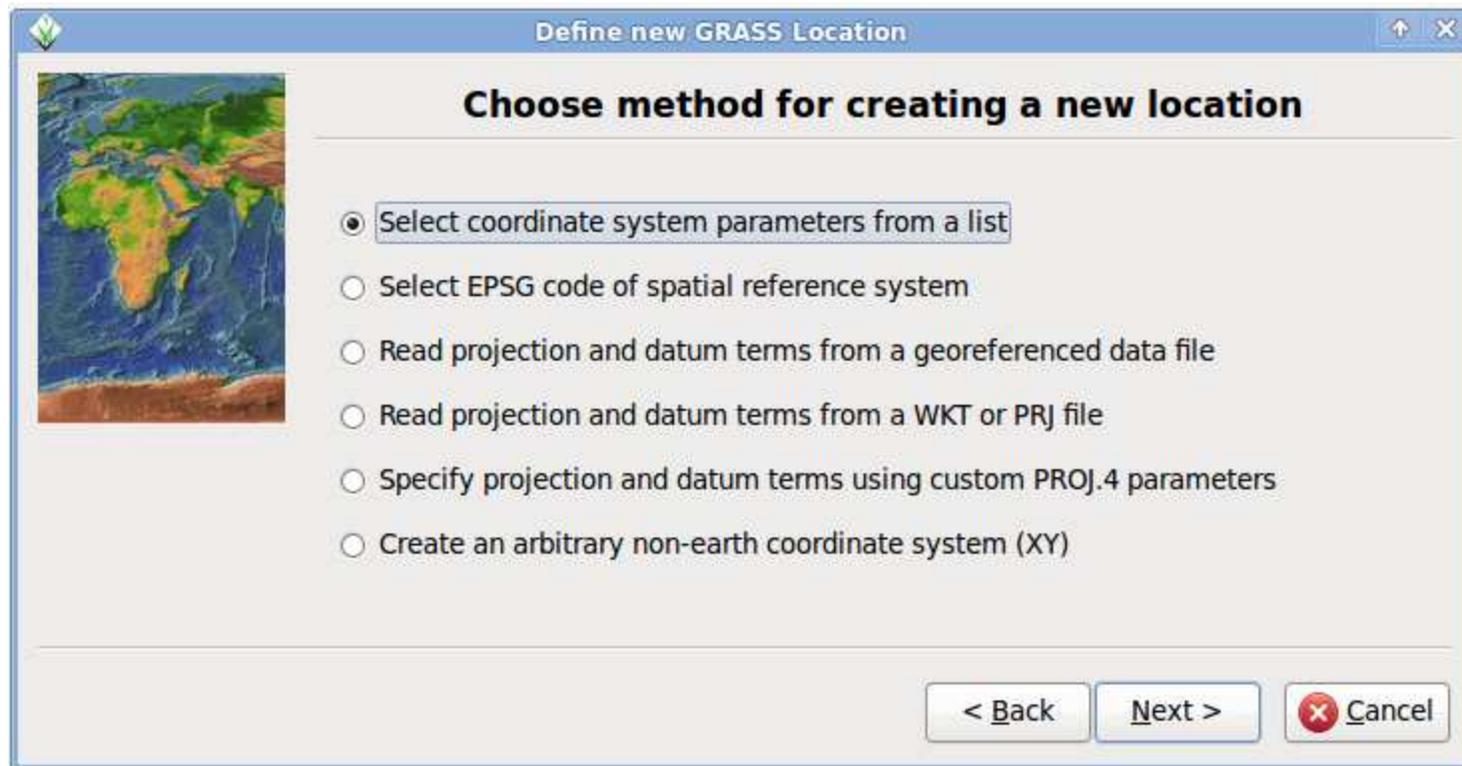
Stabilirea zonei de lucru

1. Accesam Location wizard pentru definirea unei noi zone de lucru
2. Stabilim directorul de lucru: /home/user/grassdata
3. Stabilim numele zonei de lucru: Workshop
4. Apasam butonul: Next >



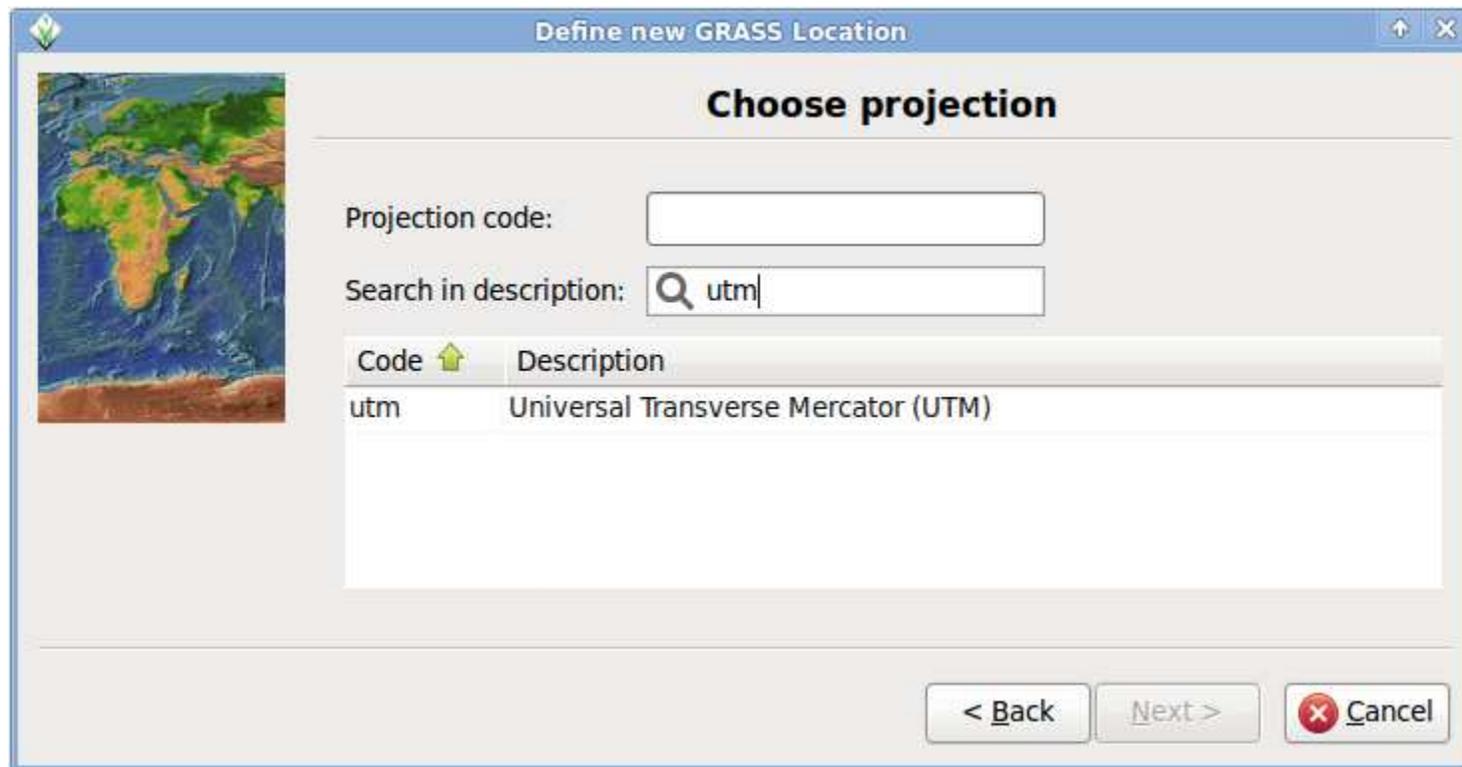
Stabilirea zonei de lucru

1. Alegem Select coordinate system parameters from a list pentru definirea coordonatelor
2. Apasam butonul: Next >



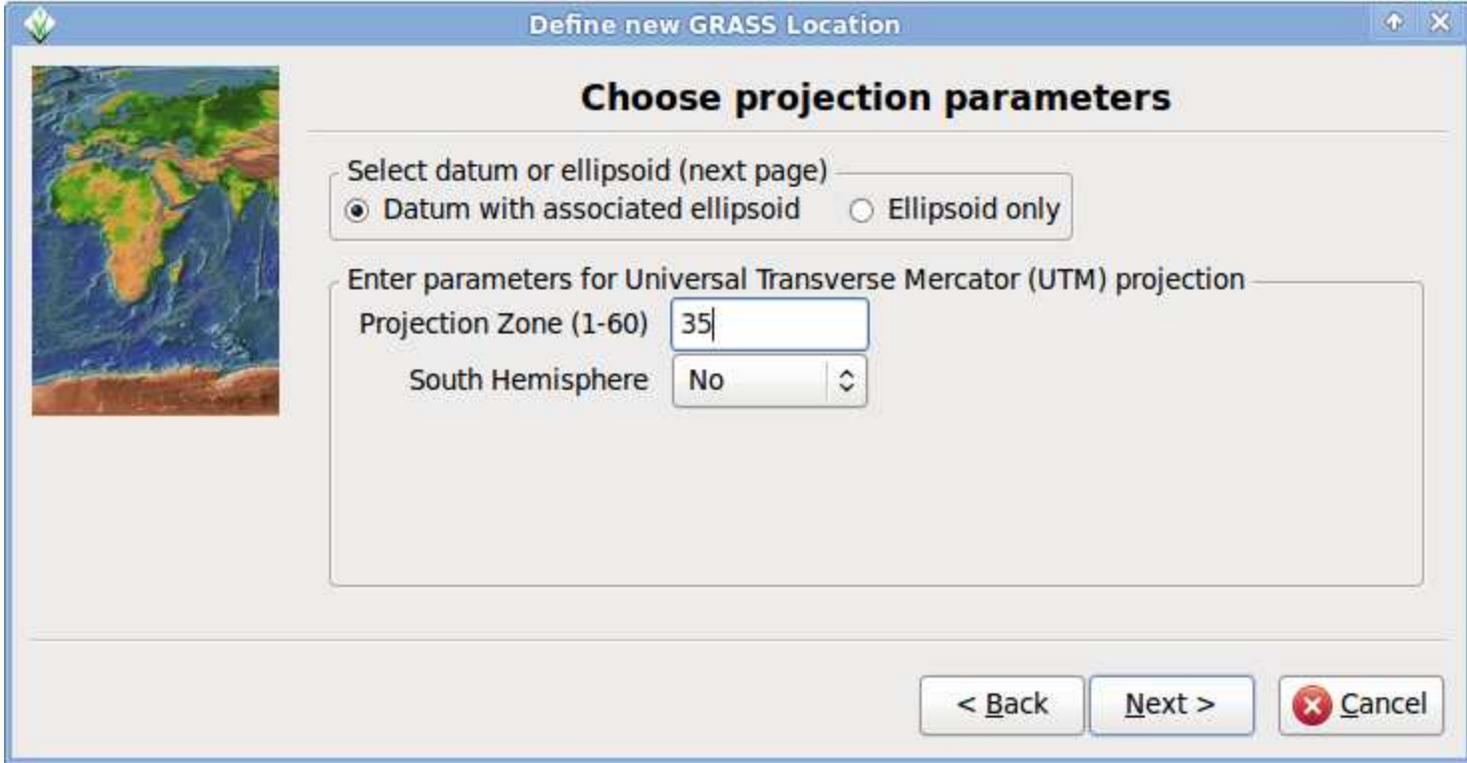
Stabilirea zonei de lucru

1. Cautam proiectia Universal Transverse Mercator (UTM) si o selectam
2. Apasam butonul: Next >



Stabilirea zonei de lucru

1. Alegem zona 35 și Datum with associated ellipsoid
2. Apasăm butonul: Next >



Define new GRASS Location

Choose projection parameters

Select datum or ellipsoid (next page)

Datum with associated ellipsoid Ellipsoid only

Enter parameters for Universal Transverse Mercator (UTM) projection

Projection Zone (1-60)

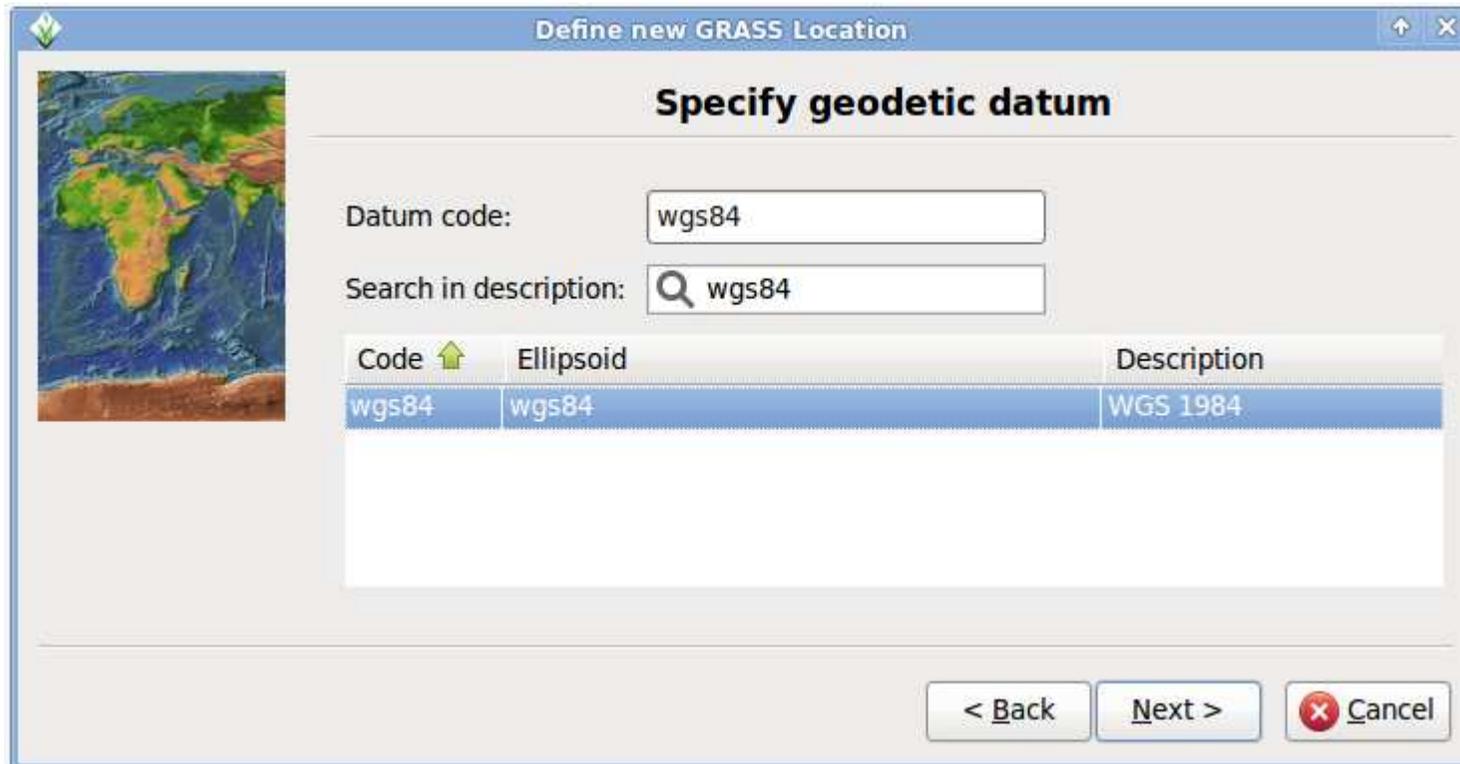
South Hemisphere

< Back Next > Cancel



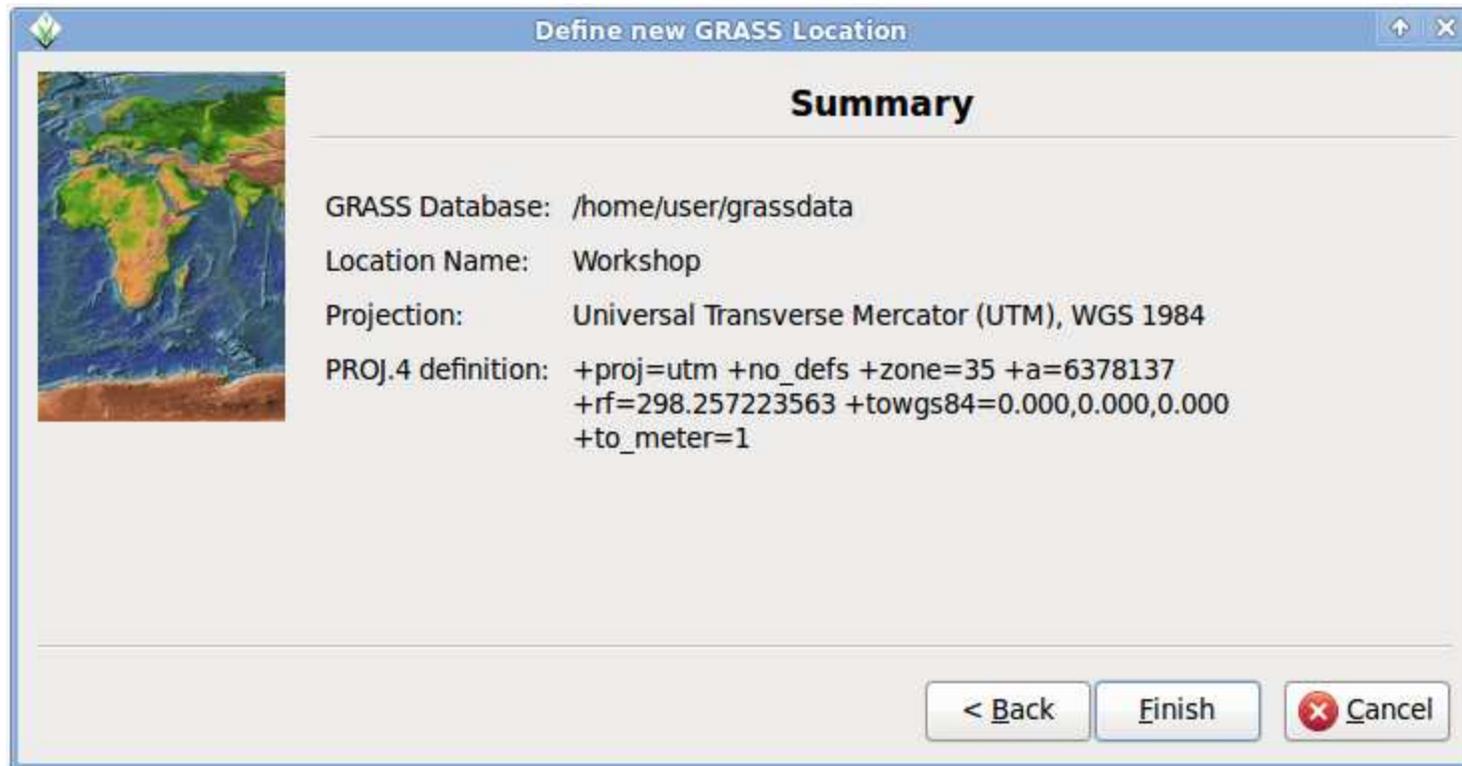
Stabilirea zonei de lucru

1. Cautam elipsoidul `wgs84` si il selectam
2. Apasam butonul: `Next >`



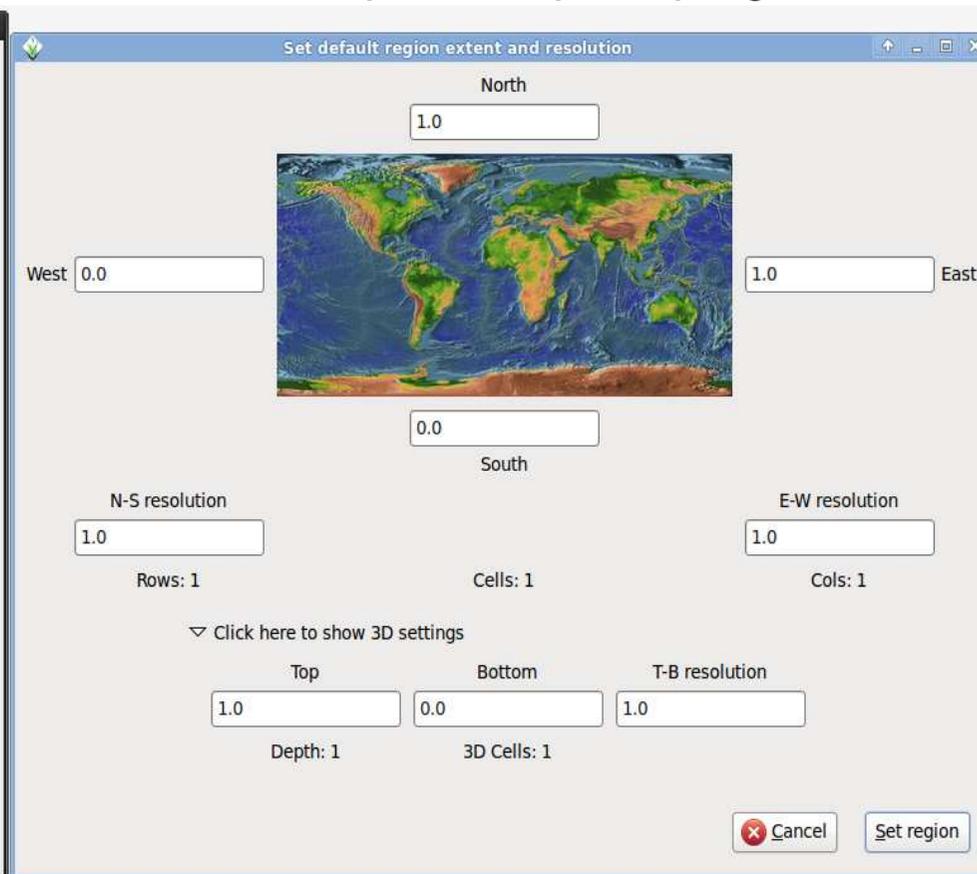
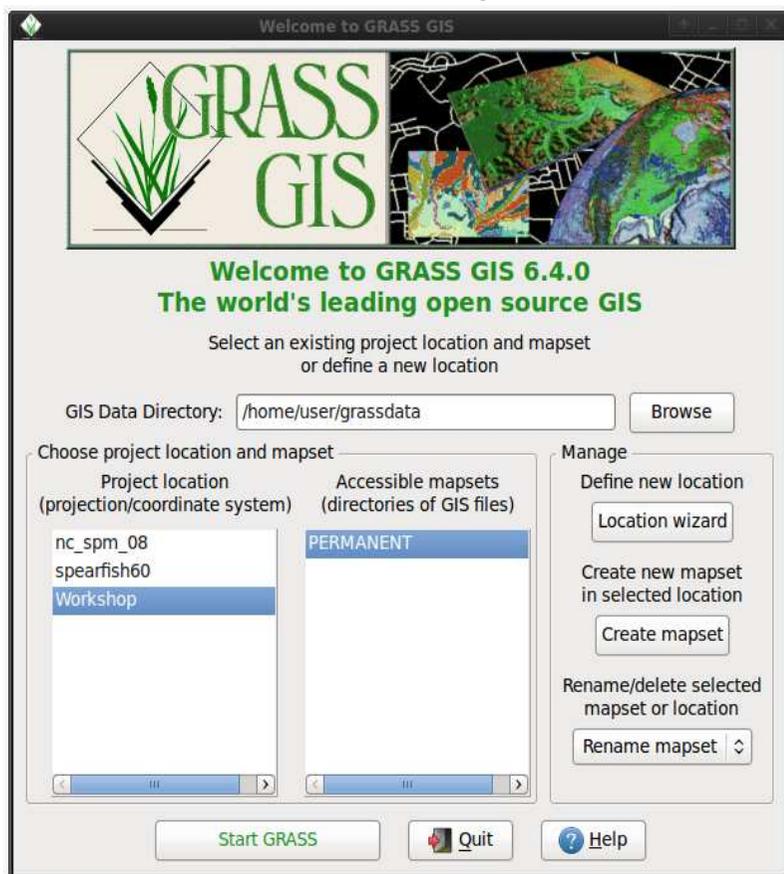
Stabilirea zonei de lucru

1. Se afișează datele zonei de lucru
2. Apasăm butonul: Finish



Stabilirea zonei de lucru

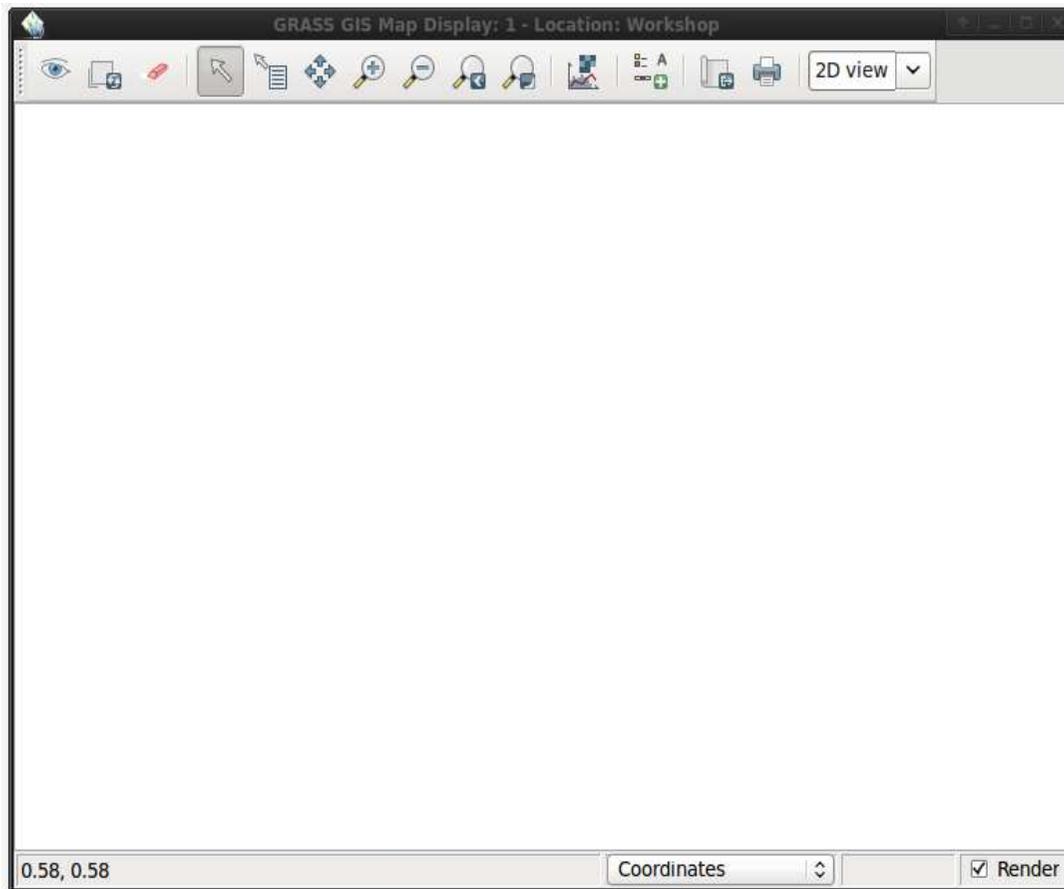
1. Stabilim marginile si proprietatile zonei de lucru
2. Apasam butonul: Set region
3. Apasam butonul Start GRASS pentru a porni programul



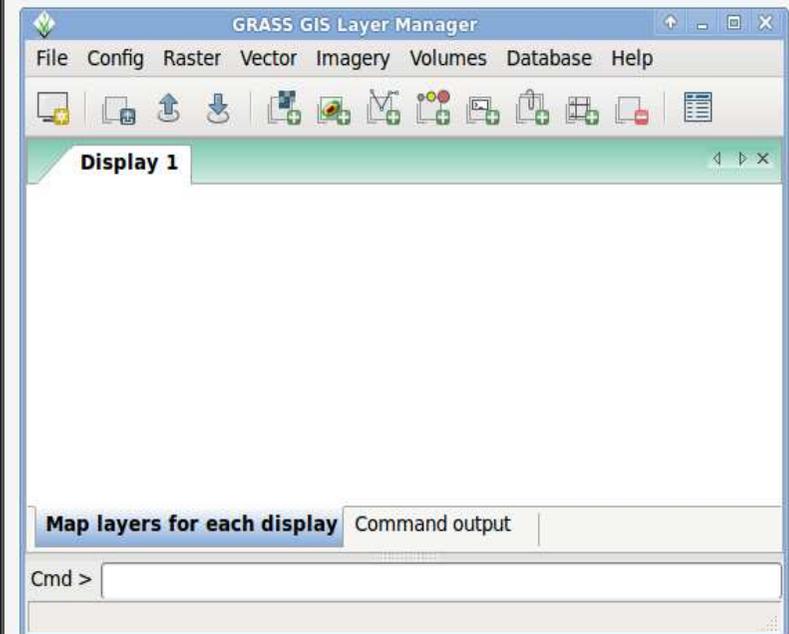
Stabilirea zonei de lucru

Ferestrele de lucru

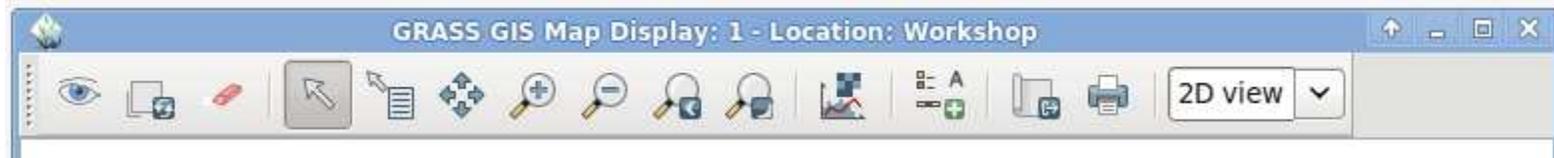
Fereastra de vizualizare



Fereastra de manipulare a stratelor



Fereastra de vizualizare



Display map: Afiseaza harta in spatiul de lucru

Re-render map: Redeseneaza harta

Display erase: Sterge harta

Pointer: Selecteaza pointer-ul

Query raster/vector map(s): Interogheaza harta afisata

Pan: Muta stanga-dreapta, jos-sus harta in spatiul de lucru

Zoom in: Mareste harta

Zoom out: Miscoreaza harta

Return to previous zoom: Intoarcere la zoom-ul anterior

Zoom options: Seteaza proprietatile functiei zoom

Analyze: Analizeaza harta afisata

Add map elements: Aadauga elementele grafice ale hartii (scara, legenda, titlu)

Save display to graphic file: Salveaza spatiul de lucru in format imagine

Print display: Imprima spatiul de lucru



Fereastra de manipulare

Bara de meniuri

File Config Raster Vector Imagery Volumes Database Help

File: opțiuni pentru lucrul cu fișierele
Config: configurează zona de lucru
Raster: manipulează datele raster
Vector: manipulează datele vectoriale
Imagery: manipulează datele tip imagine
Volume: folosit pentru calcule volumetrice
Database: manipulează bazele de date
Help: ajutor



Fereastra de manipulare

Bara de butoane



Start new display: deschide o noua fereastră de vizualizare

Load map layers: incarca straturile

Open existing workspace file: deschide un mediu de lucru existent

Save current existing workspace to file: salveaza mediul de lucru curent

Add raster map layer: adauga un strat raster

Add various raster-based map layers: adauga strat raster sub forma de grup

Add vector map layer: adauga un strat vectorial

Add various vector-based map layers: adauga strat vectorial sub forma de grup

Add command layer: adauga un strat tip comanda

Add layer group: adauga un grup de straturi

Add grid or vector labels overlay: adauga gridul matematic sau etichete

Delete selected layer: sterge stratul selectat

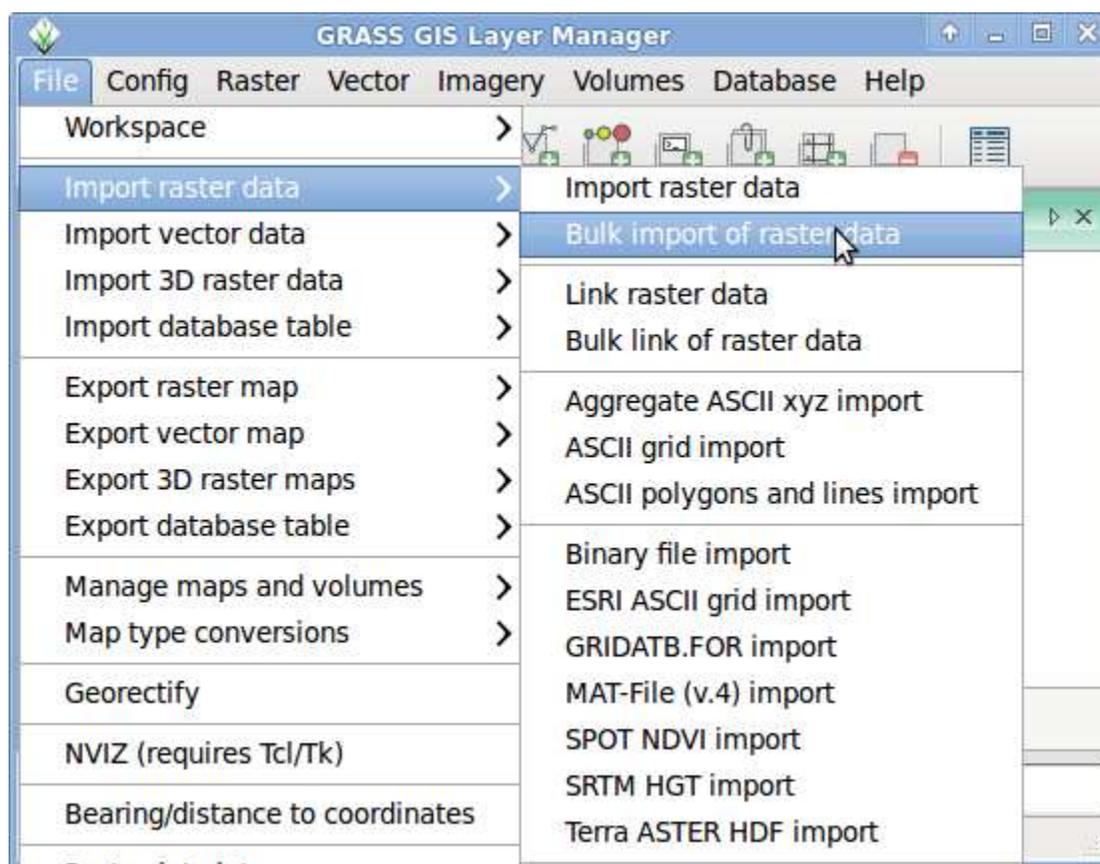
Show attribute table: vizualizeaza tabelul de attribute al stratului selectat



Manipularea datelor in GRASS

Importul datelor raster

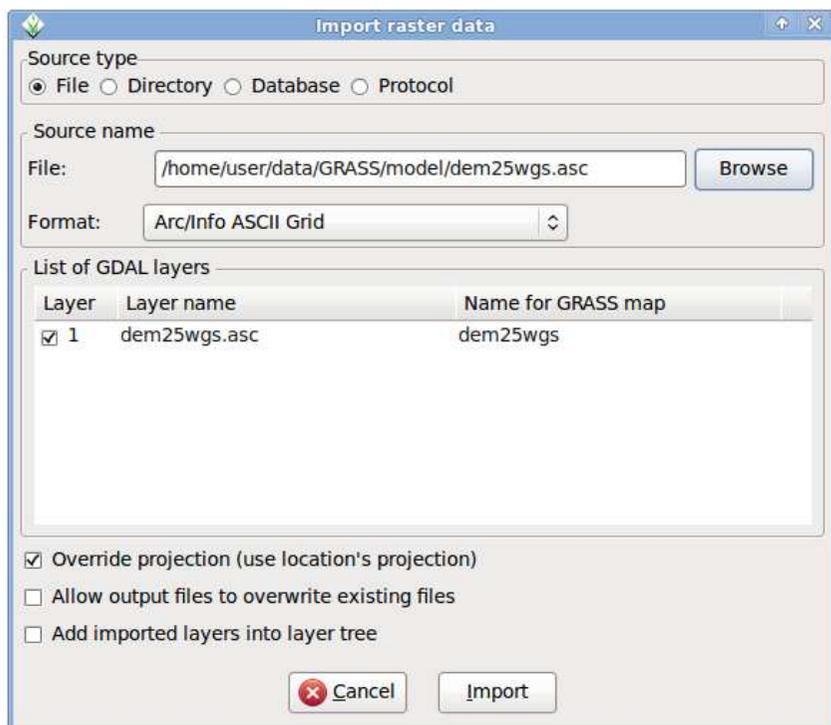
Efectuam comanda: File > Import raster data > Bulk import of raster data



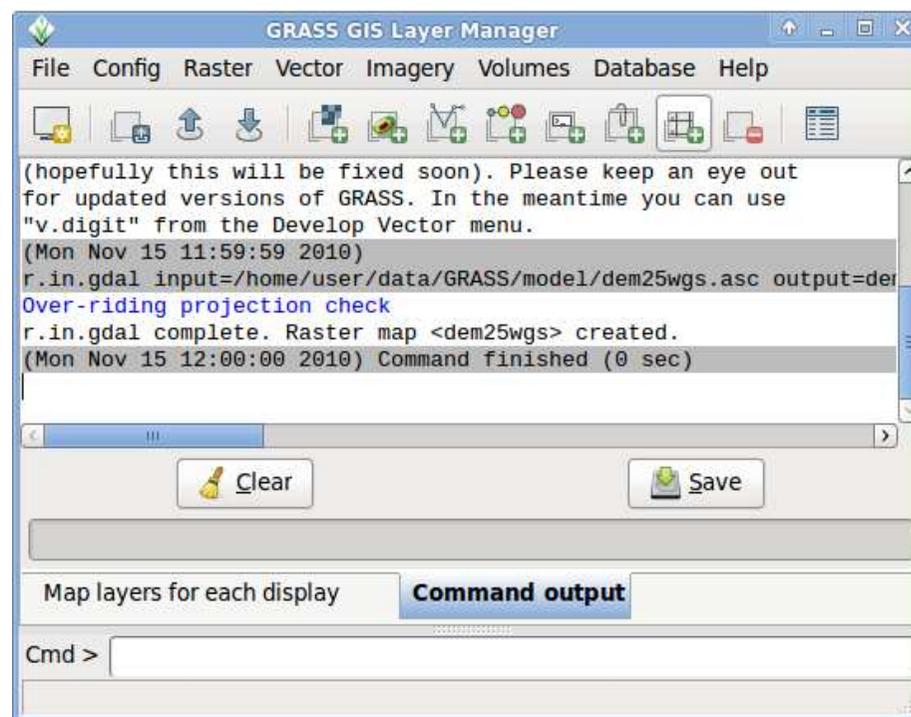
Manipularea datelor in GRASS

Importul datelor raster

1. Selectam tipul de fisier: Arc/Info ASCII Grid
2. Selectam locatia: `home/user/data/GRASS/dem25wgs.asc`
3. Apasam butonul: Import



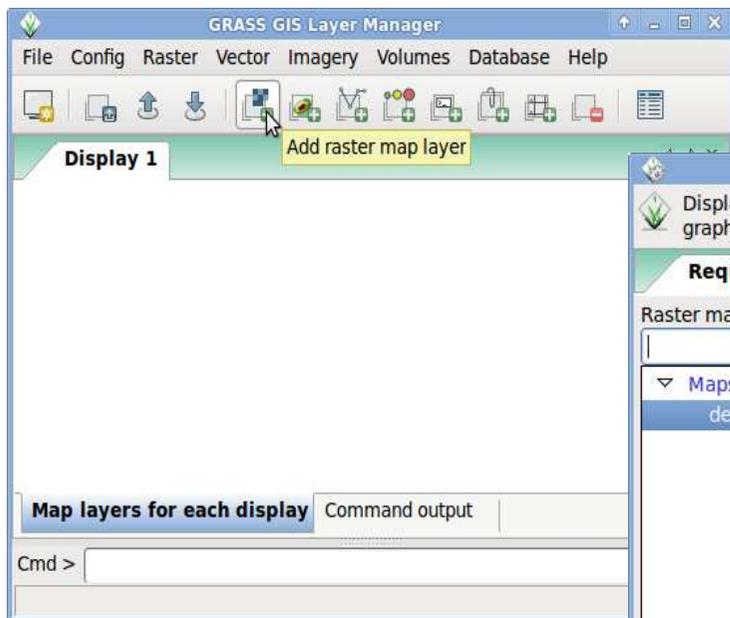
In fereastra GIS Layer Manager, la optiunea Command output, va apare urmatorul mesaj:



Manipularea datelor in GRASS

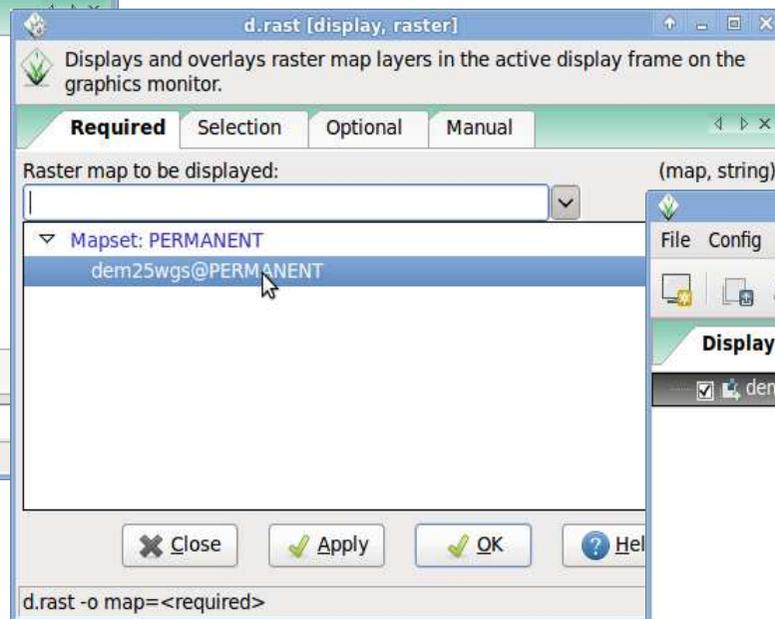
Importul datelor raster

Accesam: Add raster map layer

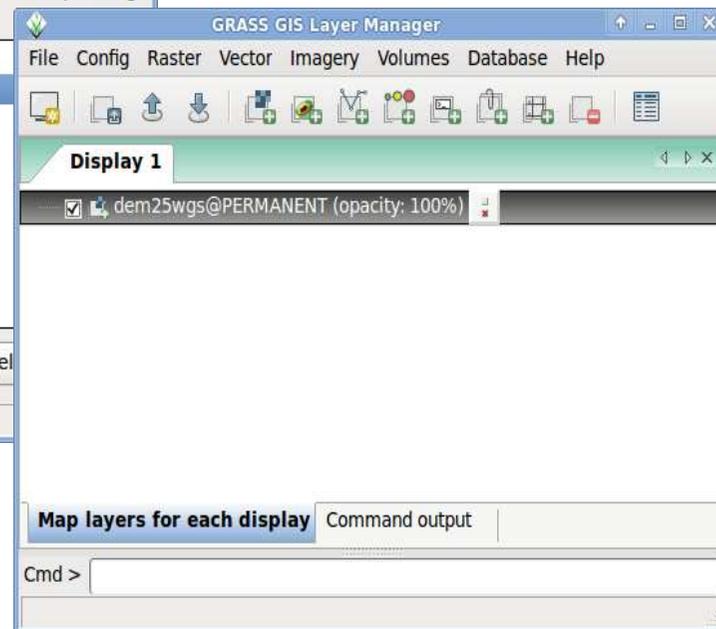


Selectam: dem25wgs@PERMANENT

In fereastra Raster map to be displayed



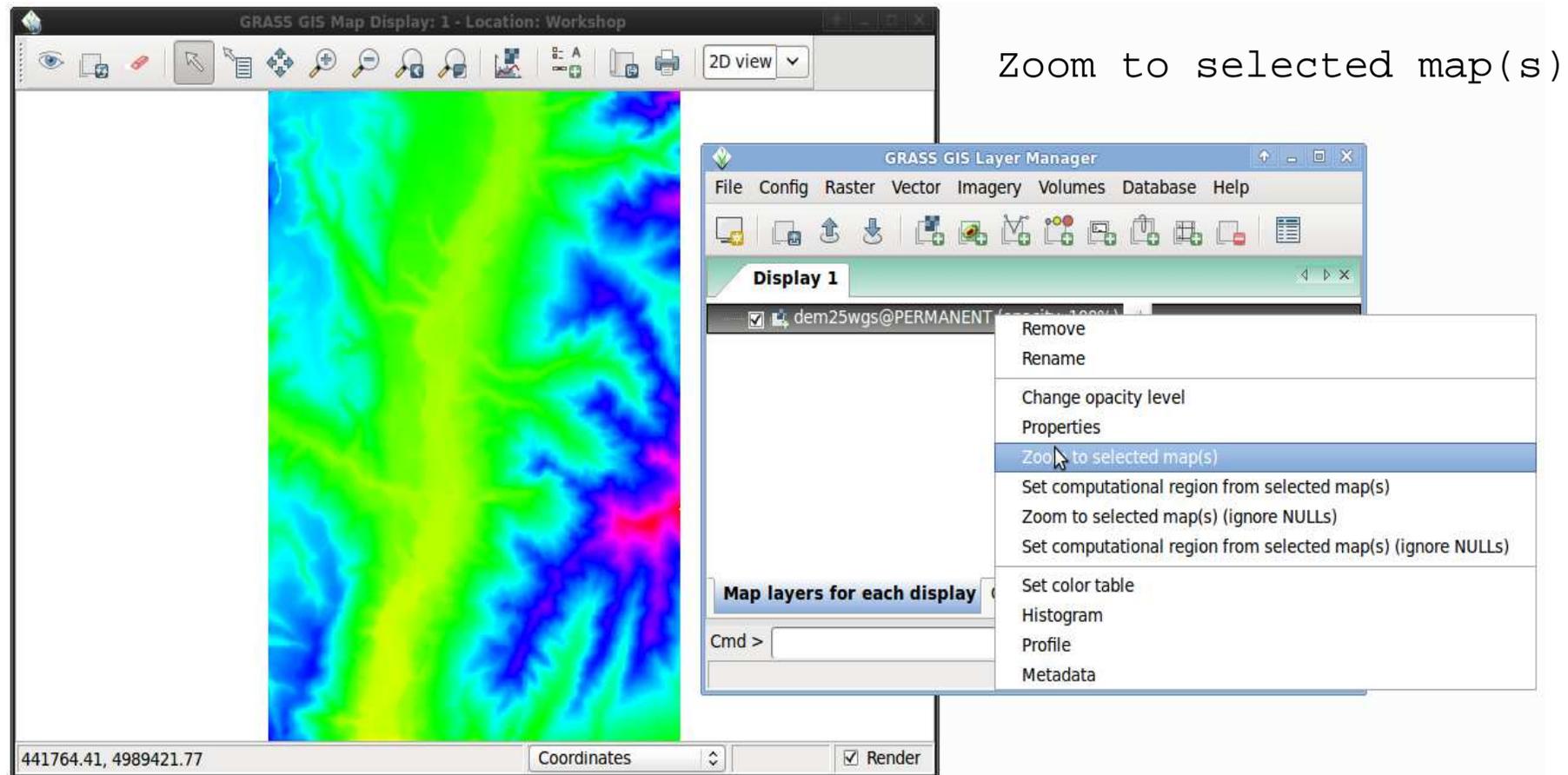
Apasam: Apply si OK



Manipularea datelor in GRASS

Importul datelor raster

Pentru vizualizarea stratului: Click dreapta de mouse si din meniul contextual alegem



The screenshot shows the GRASS GIS interface. The main window is titled "GRASS GIS Map Display: 1 - Location: Workshop" and displays a colorful raster map. The "GRASS GIS Layer Manager" window is open, showing a list of layers. A context menu is displayed over the layer "dem25wgs@PERMANENT", with the option "Zoom to selected map(s)" highlighted. The menu also includes options like "Remove", "Rename", "Change opacity level", "Properties", "Set computational region from selected map(s)", "Zoom to selected map(s) (ignore NULLs)", "Set computational region from selected map(s) (ignore NULLs)", "Set color table", "Histogram", "Profile", and "Metadata".

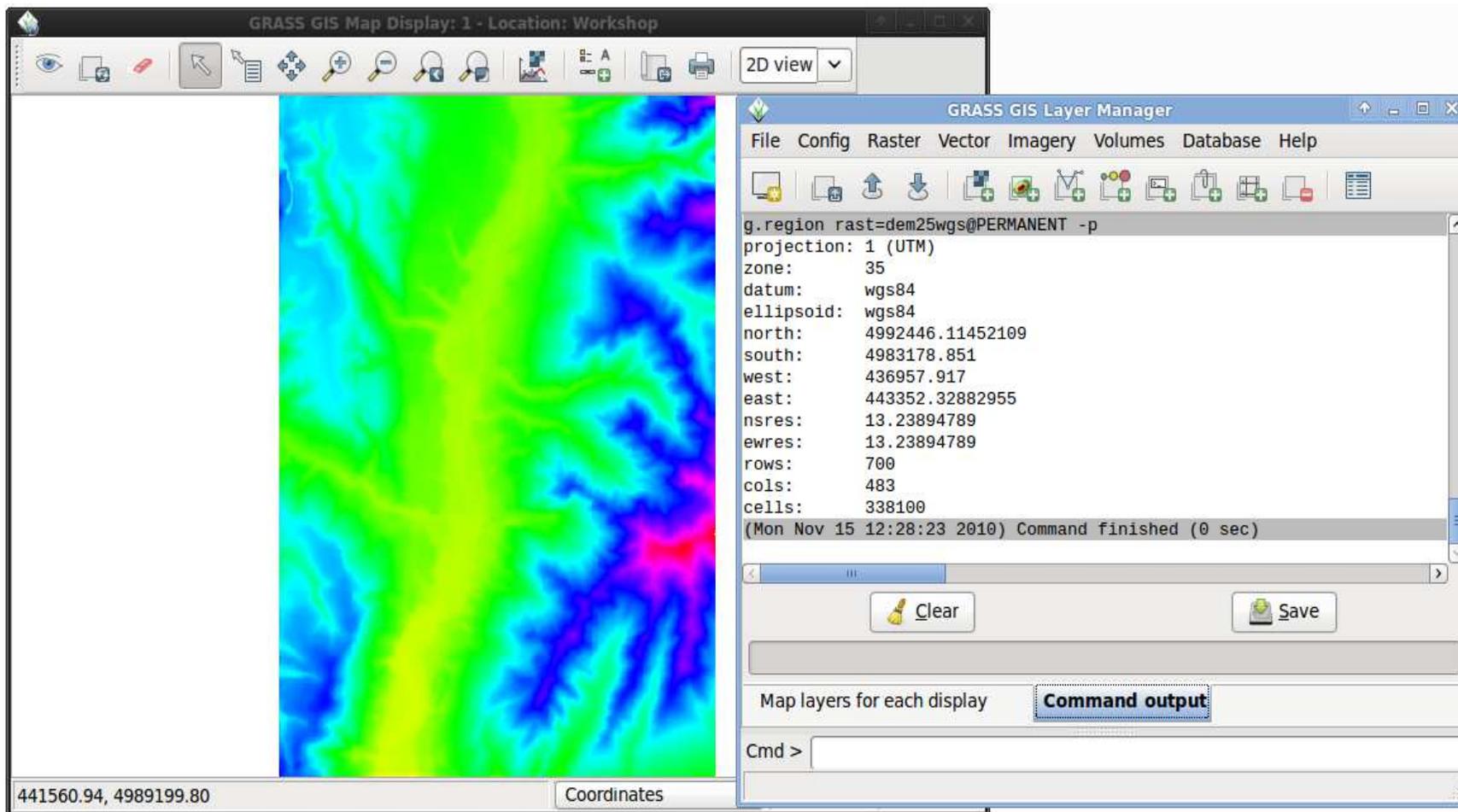
Zoom to selected map(s)



Manipularea datelor in GRASS

Importul datelor raster

In optiunea Command output vor apare datele analitice ale modelului importat



The screenshot displays the GRASS GIS interface. The main window, titled "GRASS GIS Map Display: 1 - Location: Workshop", shows a 2D view of a raster map with a color gradient from blue to red. The Layer Manager window, titled "GRASS GIS Layer Manager", is open on the right. It shows the command `g.region rast=dem25wgs@PERMANENT -p` and its output, including projection details (UTM, zone 35, datum wgs84) and map dimensions (rows: 700, cols: 483, cells: 338100). The "Command output" button is highlighted, indicating that the command's results are being displayed in the output area below.

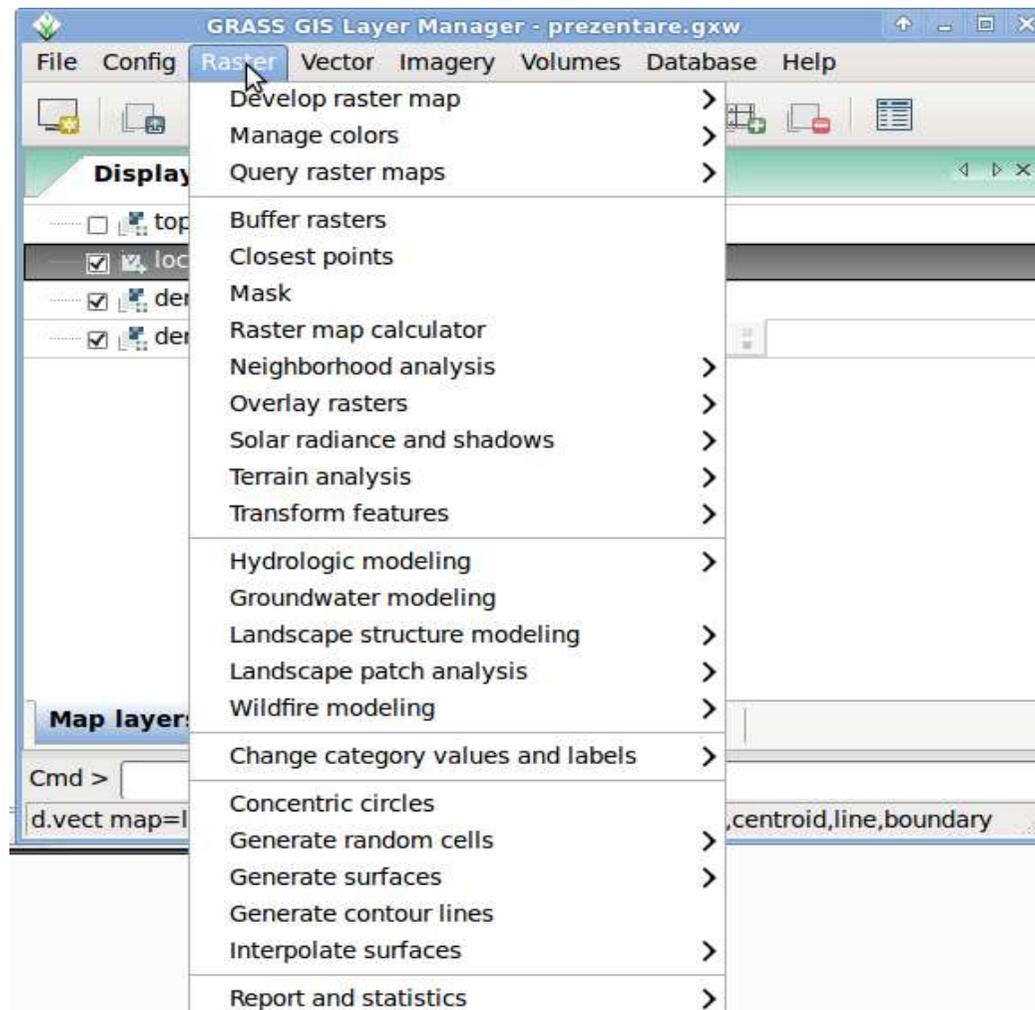
```
g.region rast=dem25wgs@PERMANENT -p
projection: 1 (UTM)
zone:      35
datum:     wgs84
ellipsoid: wgs84
north:     4992446.11452109
south:     4983178.851
west:      436957.917
east:      443352.32882955
nsres:     13.23894789
ewres:     13.23894789
rows:      700
cols:      483
cells:     338100
(Mon Nov 15 12:28:23 2010) Command finished (0 sec)
```



Manipularea datelor in GRASS

Interogarea datelor raster

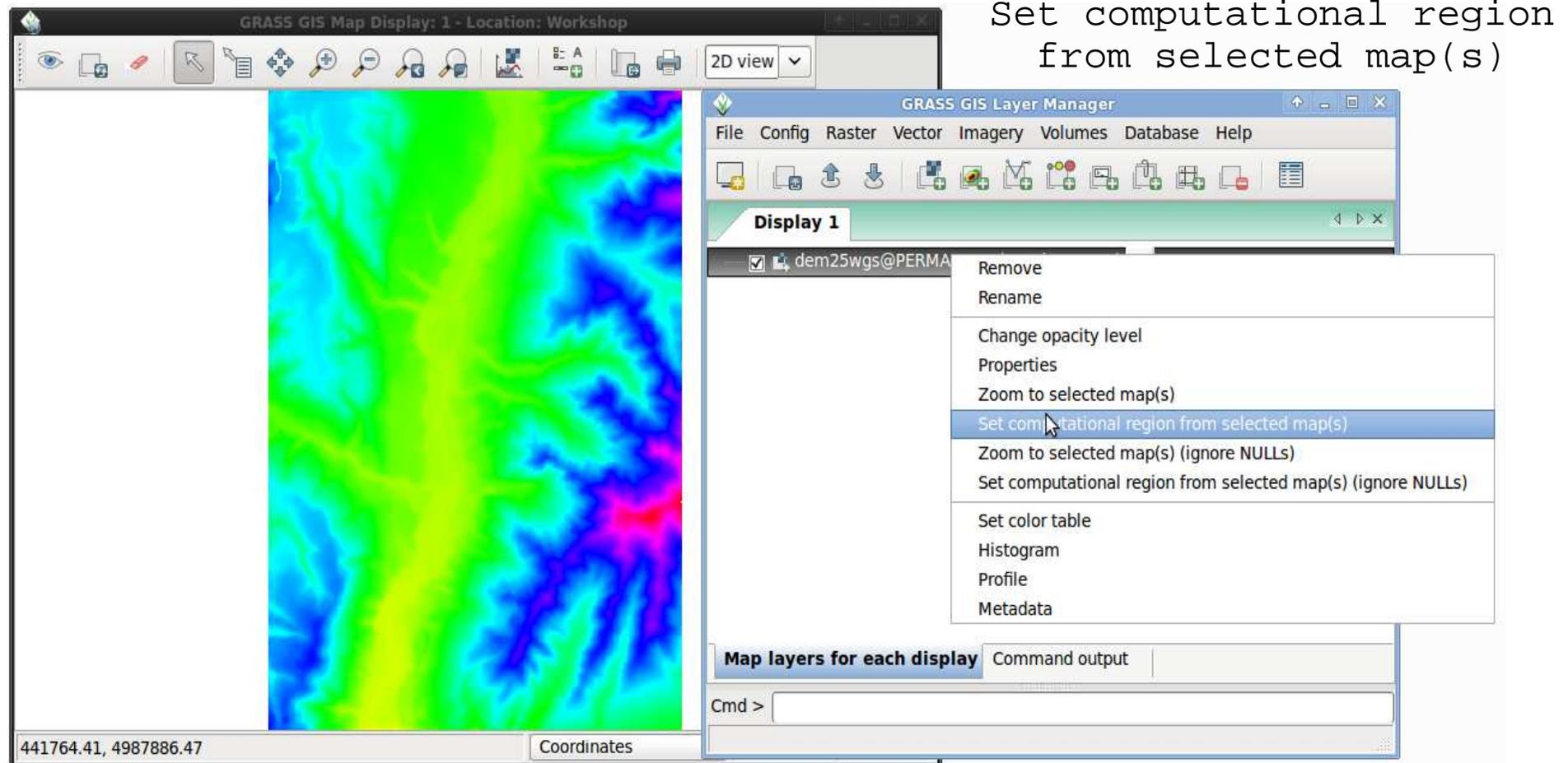
Optiuni pentru manipulare:



Manipularea datelor in GRASS

Interogarea datelor raster

Pentru selectarea zonei: Click dreapta de mouse si din meniul contextual alegem



The screenshot displays the GRASS GIS Map Display window with a raster map. A right-click context menu is open over the map, with the option "Set computational region from selected map(s)" highlighted. The Layer Manager window is also visible, showing the layer "dem25wgs@PERMA".

Set computational region from selected map(s)

GRASS GIS Map Display: 1 - Location: Workshop

GRASS GIS Layer Manager

File Config Raster Vector Imagery Volumes Database Help

Display 1

- Remove
- Rename
- Change opacity level
- Properties
- Zoom to selected map(s)
- Set computational region from selected map(s)**
- Zoom to selected map(s) (ignore NULLs)
- Set computational region from selected map(s) (ignore NULLs)
- Set color table
- Histogram
- Profile
- Metadata

Map layers for each display Command output

Cmd >

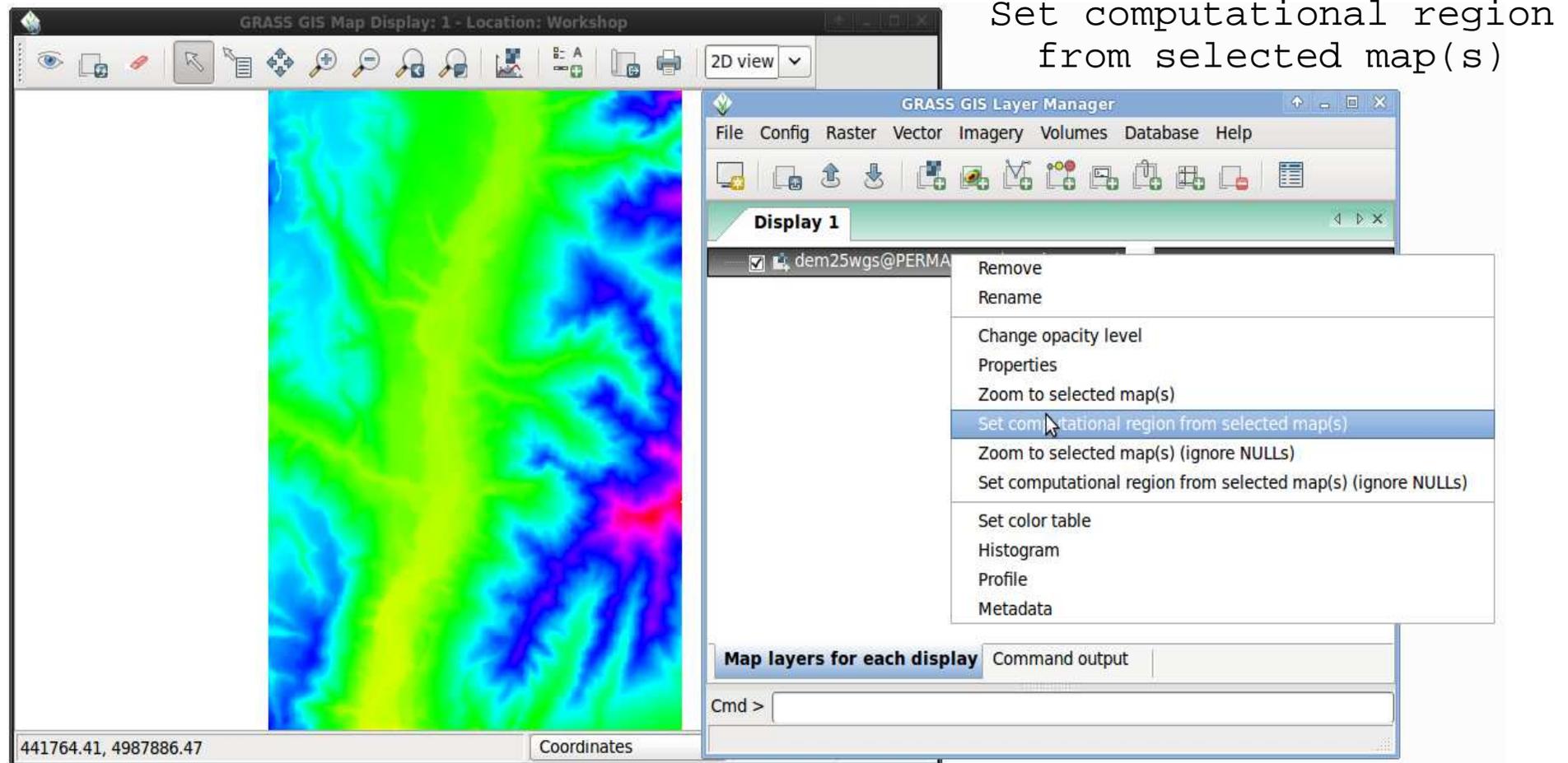
441764.41, 4987886.47 Coordinates



Manipularea datelor in GRASS

Interogarea datelor raster

Pentru selectarea zonei: Click dreapta de mouse si din meniul contextual alegem



The screenshot shows the GRASS GIS interface. The main window is titled "GRASS GIS Map Display: 1 - Location: Workshop" and displays a 2D view of a raster map with a color scale from blue to red. The "GRASS GIS Layer Manager" window is open, showing a list of layers. A right-click context menu is displayed over the layer "dem25wgs@PERMA", with the option "Set computational region from selected map(s)" highlighted. The menu also includes options like "Remove", "Rename", "Change opacity level", "Properties", "Zoom to selected map(s)", "Zoom to selected map(s) (ignore NULLs)", "Set computational region from selected map(s) (ignore NULLs)", "Set color table", "Histogram", "Profile", and "Metadata". The status bar at the bottom shows coordinates "441764.41, 4987886.47".

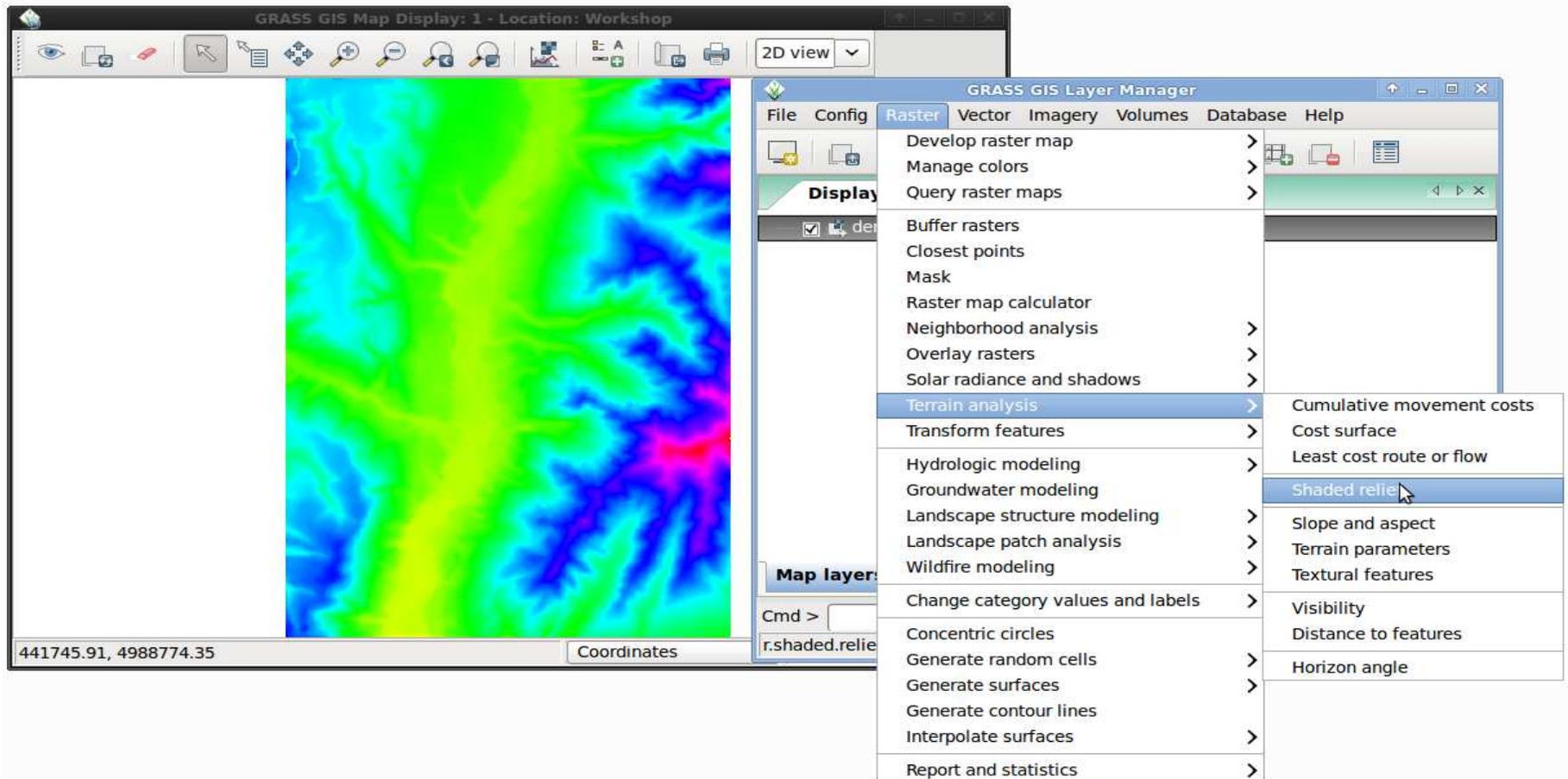
Set computational region from selected map(s)



Manipularea datelor in GRASS

Interogarea datelor raster

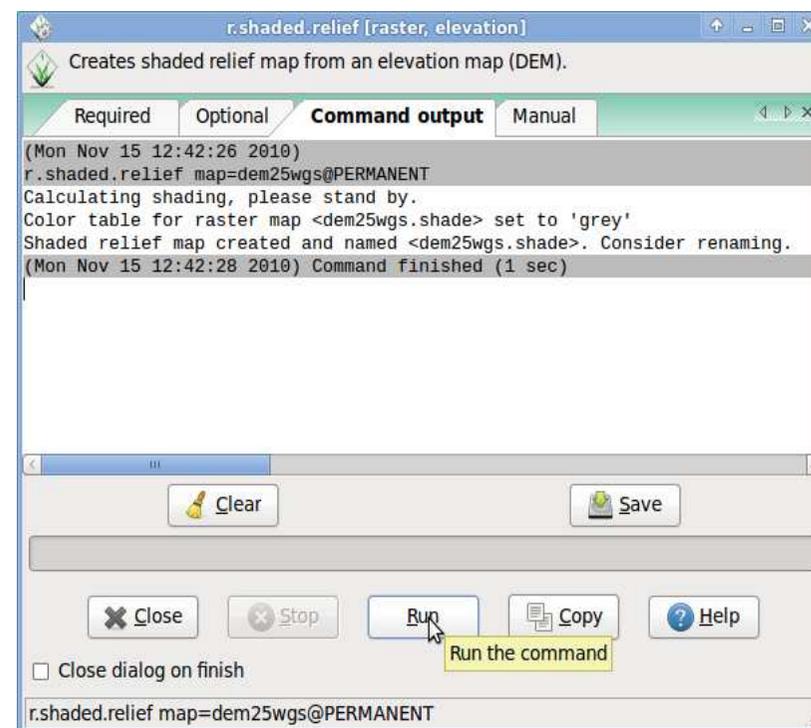
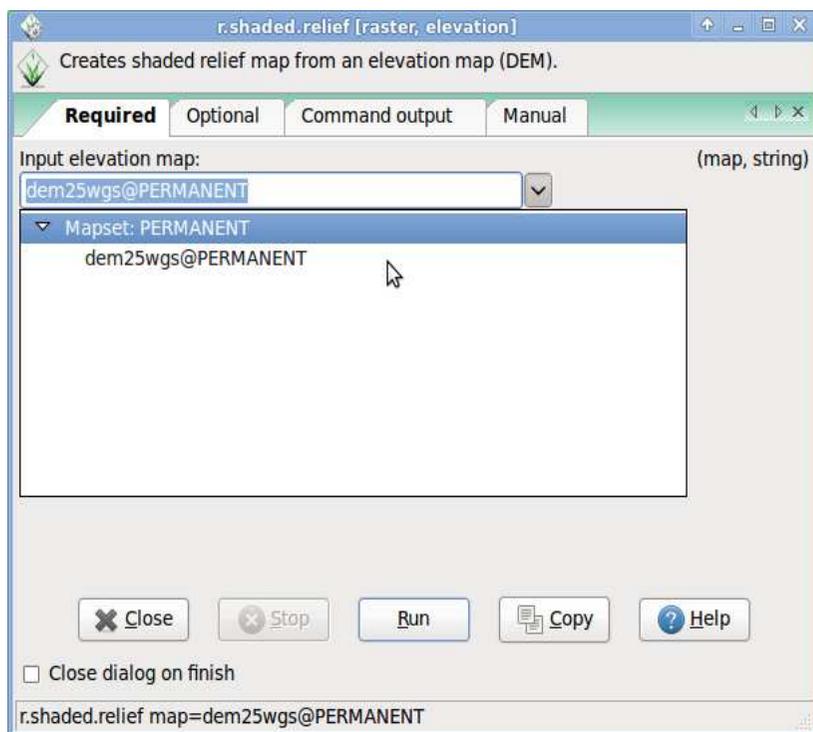
Raster > Terrain analysis > Shaded relief



Manipularea datelor in GRASS

Interogarea datelor raster

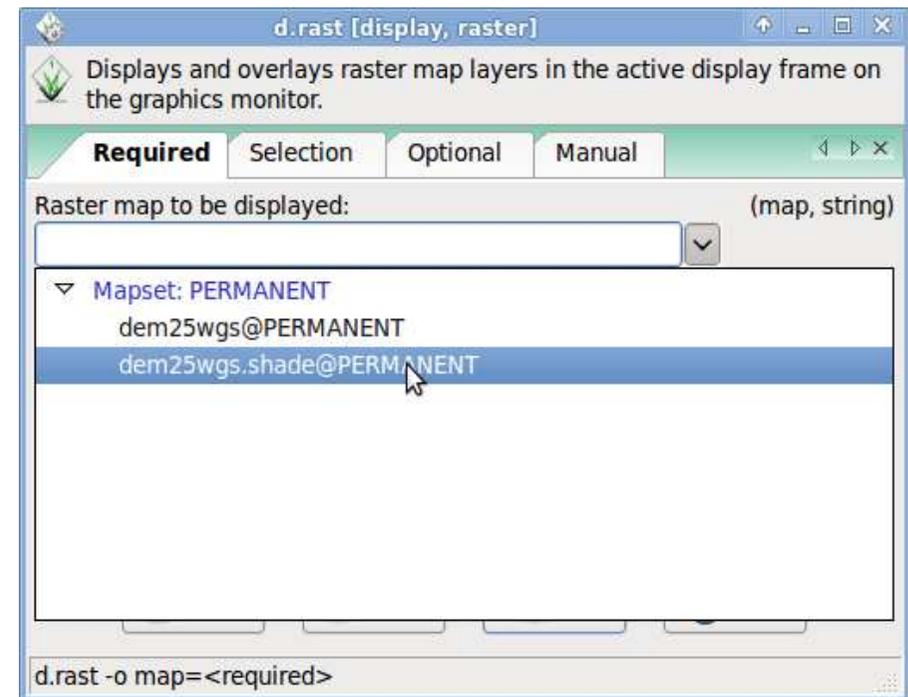
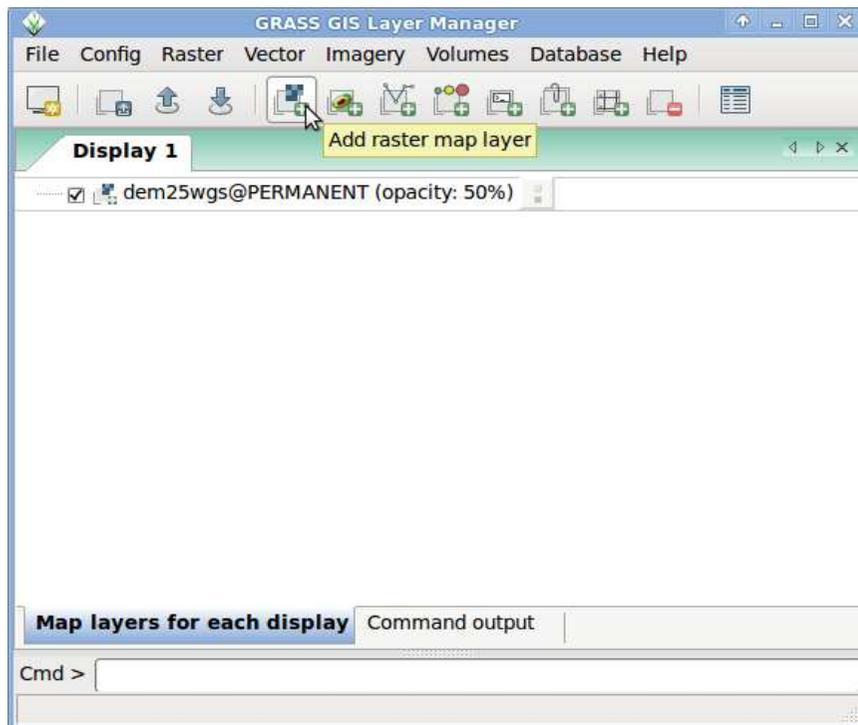
La Input elevation map alegem: dem25wgs@PERMANENT si apasam Run apoi Close



Manipularea datelor in GRASS

Interogarea datelor raster

Accesam Add raster map layer, la Raster map to be displayed alegem: dem25wgs.shade@PERMANENT, apasam Apply si Close



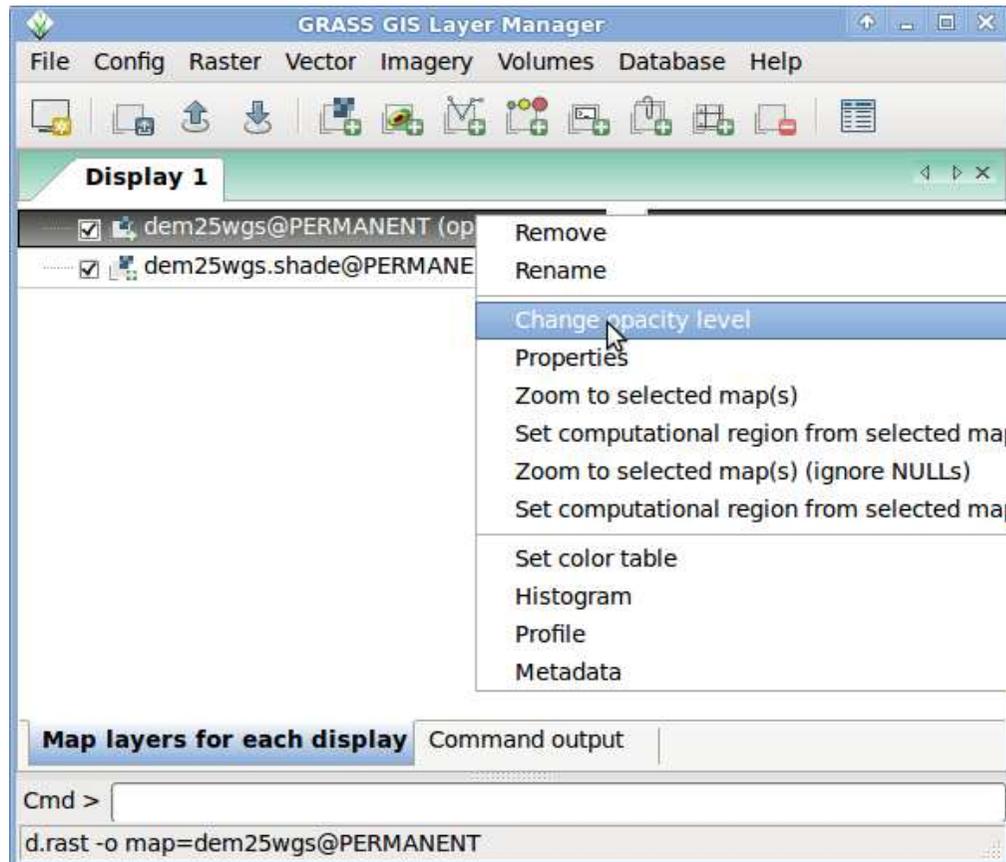
Manipularea datelor in GRASS

Interogarea datelor raster - Realizarea 3D

In fereastra GRASS GIS Layer Manager, schimbam ordinea de afisare a stratelor astfel:

1. dem25wgs@PERMANENT

2. dem25wgs.shade@PERMANENT



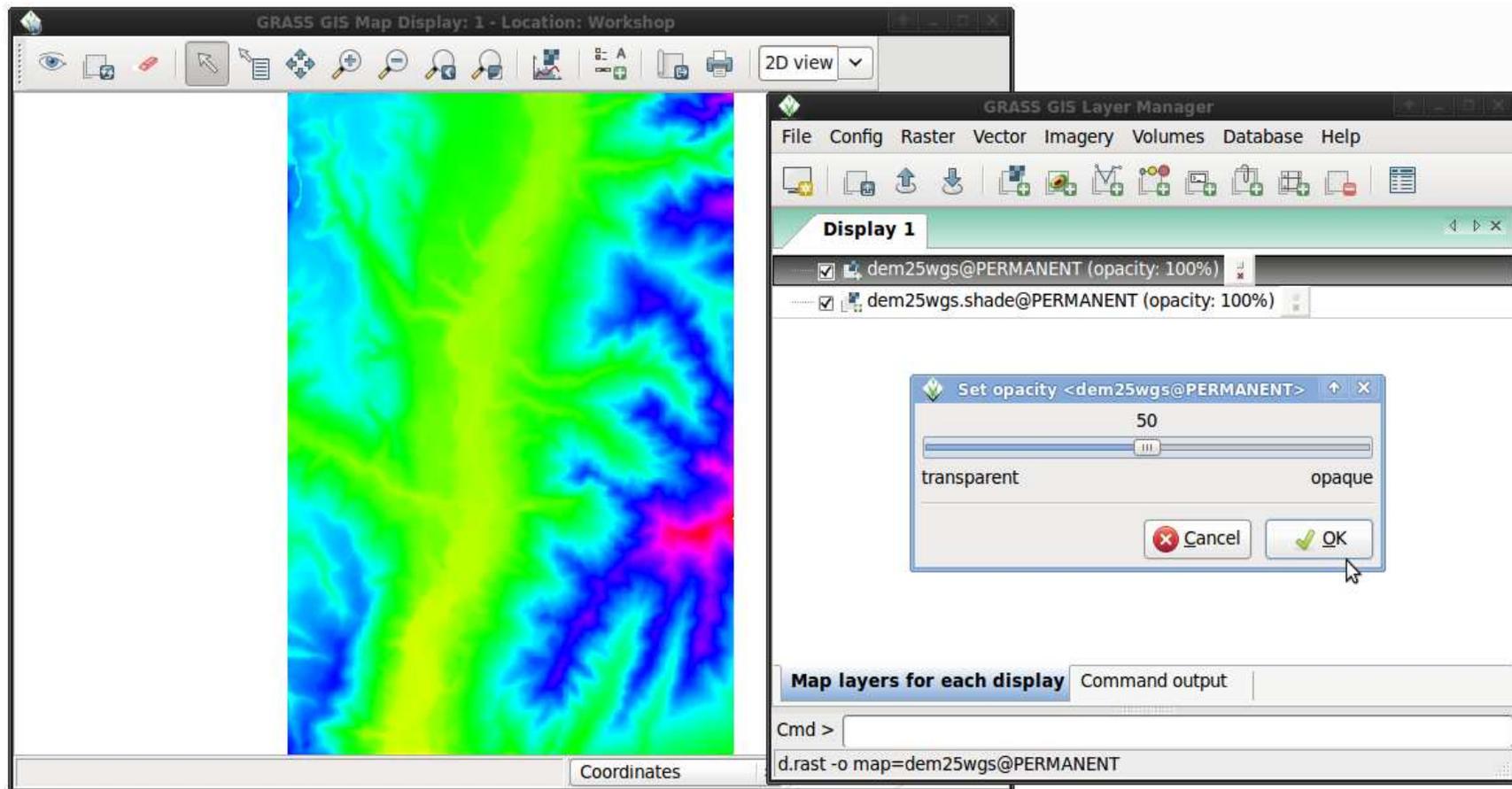
Click dreapta pe
dem25wgs@PERMANENT
si alegem
Change opacity level



Manipularea datelor in GRASS

Interogarea datelor raster

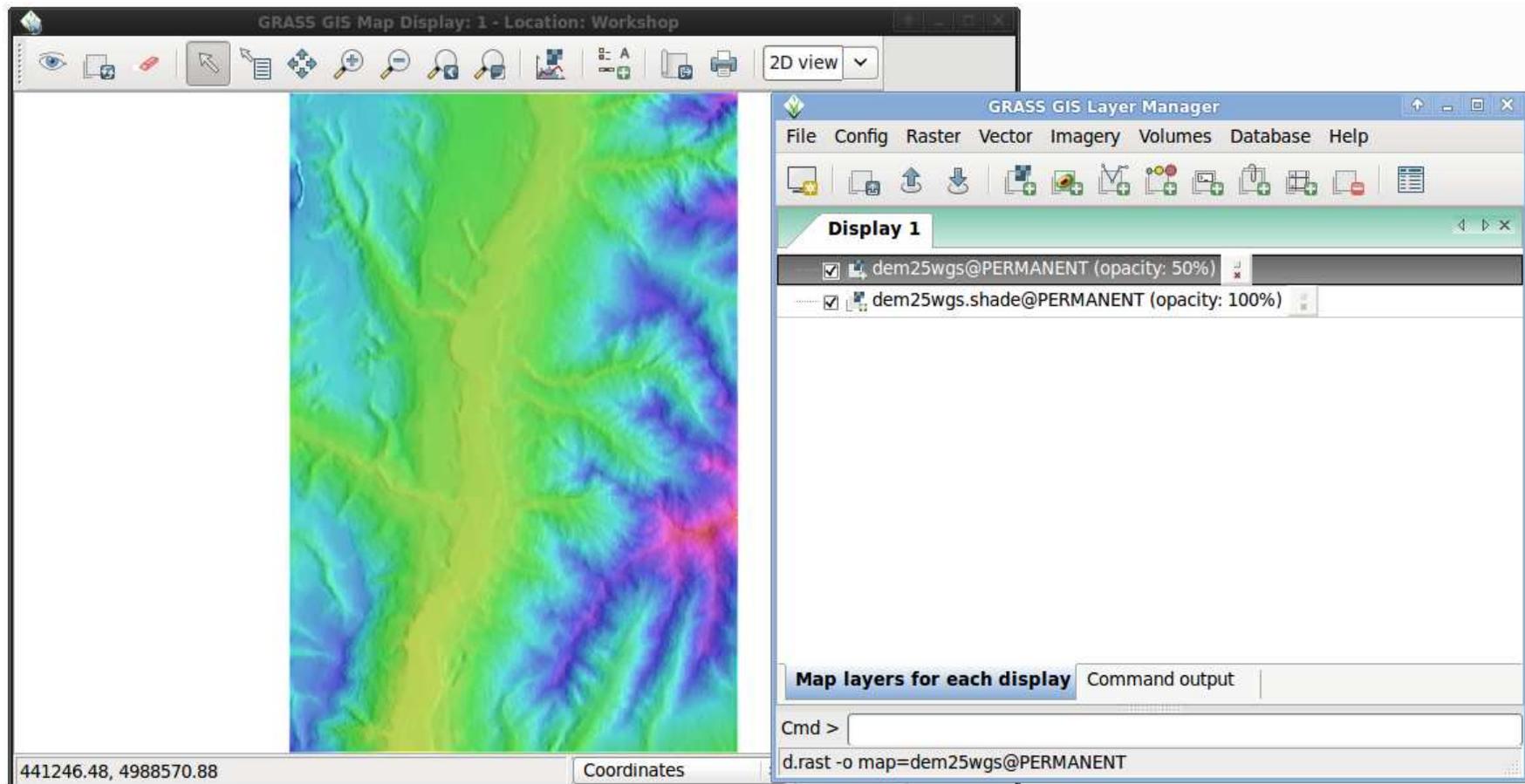
In fereastra Set opacity, selectam opacitatea la 50 unitati



Manipularea datelor in GRASS

Interogarea datelor raster

Rezultatul final



The screenshot displays the GRASS GIS interface. The main window, titled "GRASS GIS Map Display: 1 - Location: Workshop", shows a 2D view of a raster map. The map is a color-coded elevation or terrain model, with a color scale ranging from blue (low elevation) to red (high elevation). The map is displayed in a vertical orientation. The interface includes a toolbar with various icons for navigation and editing, and a status bar at the bottom showing coordinates: 441246.48, 4988570.88.

Overlaid on the right side is the "GRASS GIS Layer Manager" window. It has a menu bar (File, Config, Raster, Vector, Imagery, Volumes, Database, Help) and a toolbar. The "Display 1" tab is active, showing a list of layers:

- dem25wgs@PERMANENT (opacity: 50%)
- dem25wgs.shade@PERMANENT (opacity: 100%)

At the bottom of the Layer Manager, there is a "Map layers for each display" section and a "Command output" section. The command output shows:

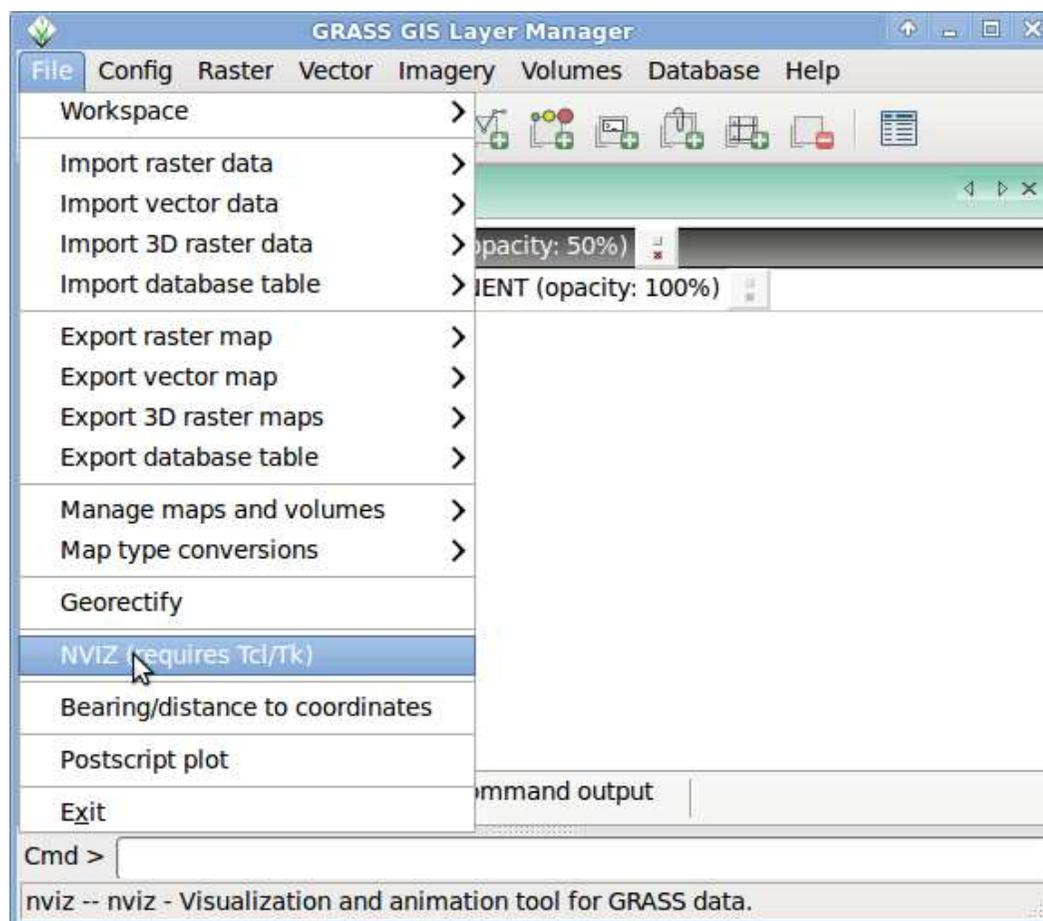
```
Cmd > d.rast -o map=dem25wgs@PERMANENT
```



Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

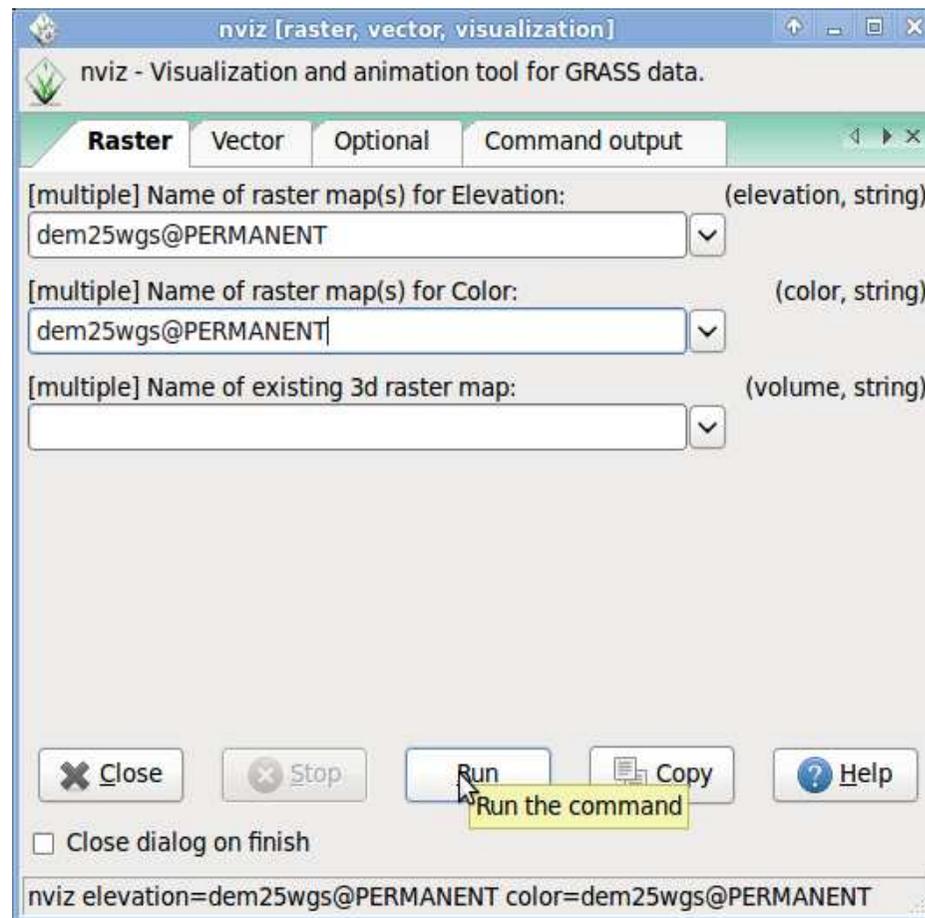
In fereastra GRASS GIS Layer Manager efectuați: File > NVIZ



Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

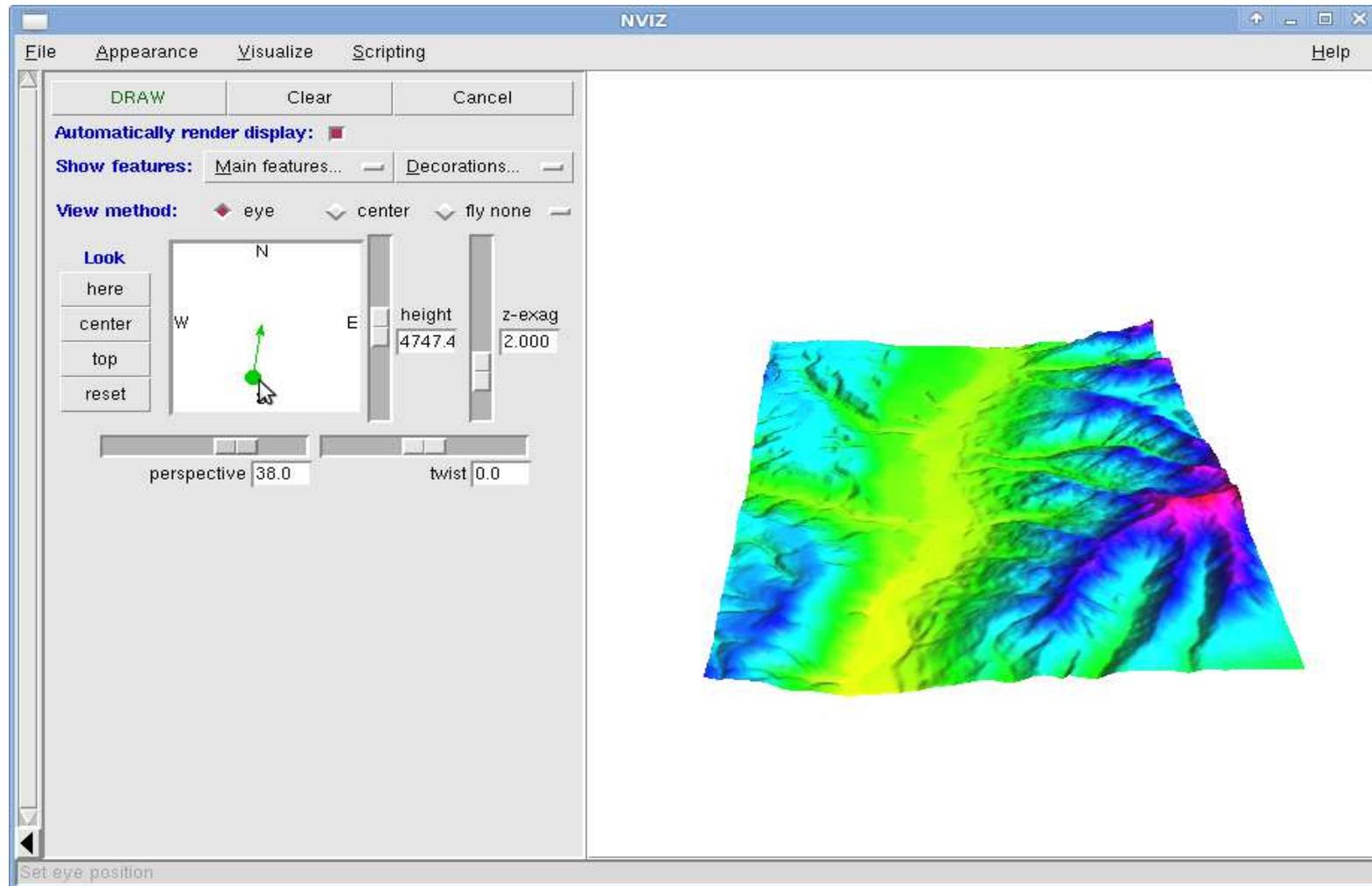
Alegem la Name of raster(s) for Elevations: dem25wgs@PERMANENT, iar la Name of raster map(s) for Color: dem25wgs@PERMANENT si rulam comanda.



Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Rezultatul final:

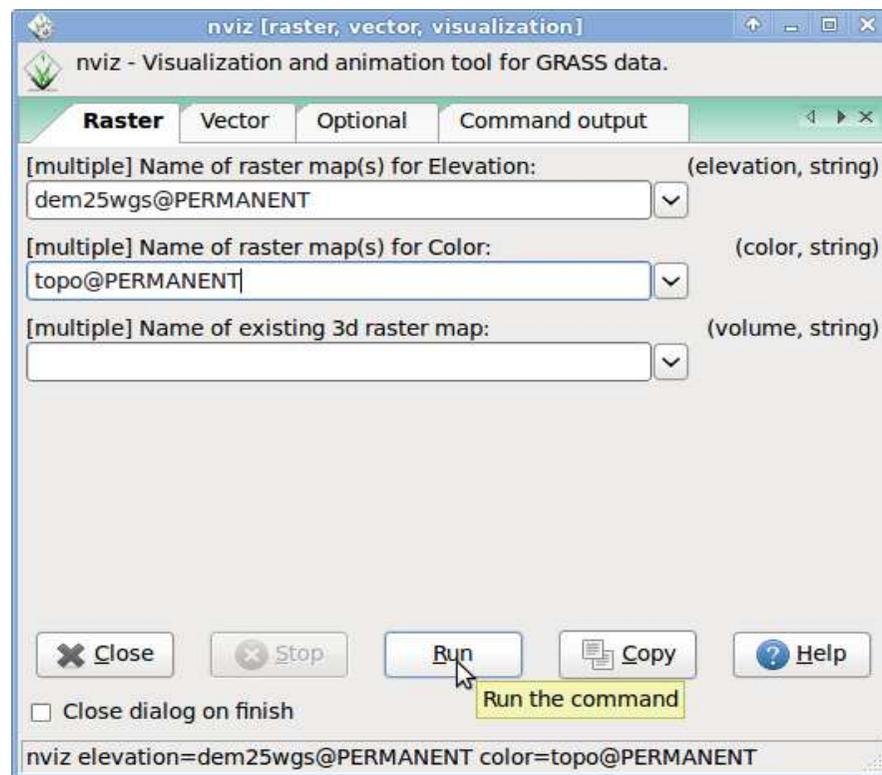


Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

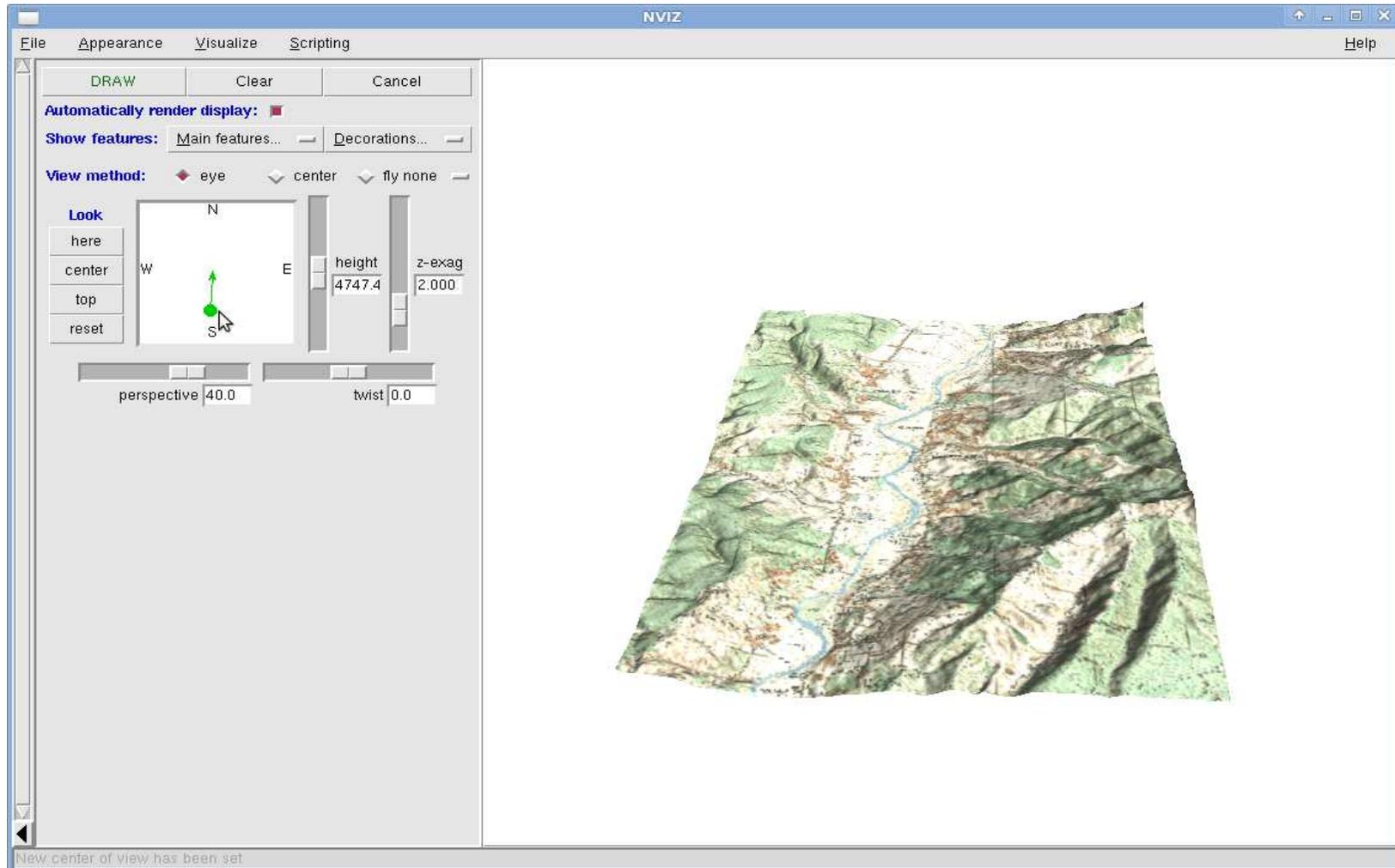
Drapare harta topografica:

1. Importare harta in spatiul de lucru
2. Deschiderea ferestrei NVIZ
3. Alegem la Name of raster(s) for Elevations: dem25wgs@PERMANENT, iar la Name of raster map(s) for Color: topo@PERMANENT si rulam comanda.



Interogarea datelor raster - Vizualizare 3D

Rezultatul final:

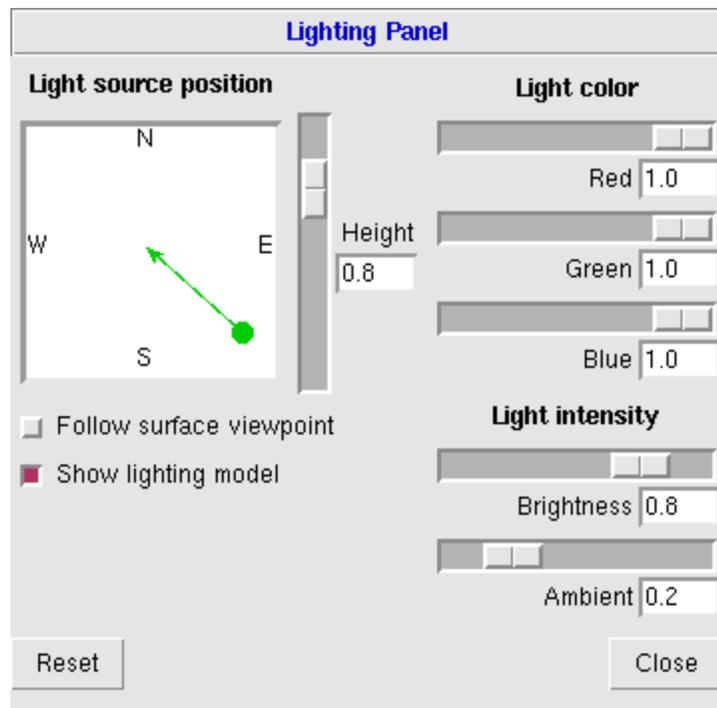


Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Schimbarea proprietatilor de vizualizare

Se face cu optiunea Lighting Panel : Appearance > Lighting



Light source position: directia de iluminare

Light color: modifica nuantele de culoare

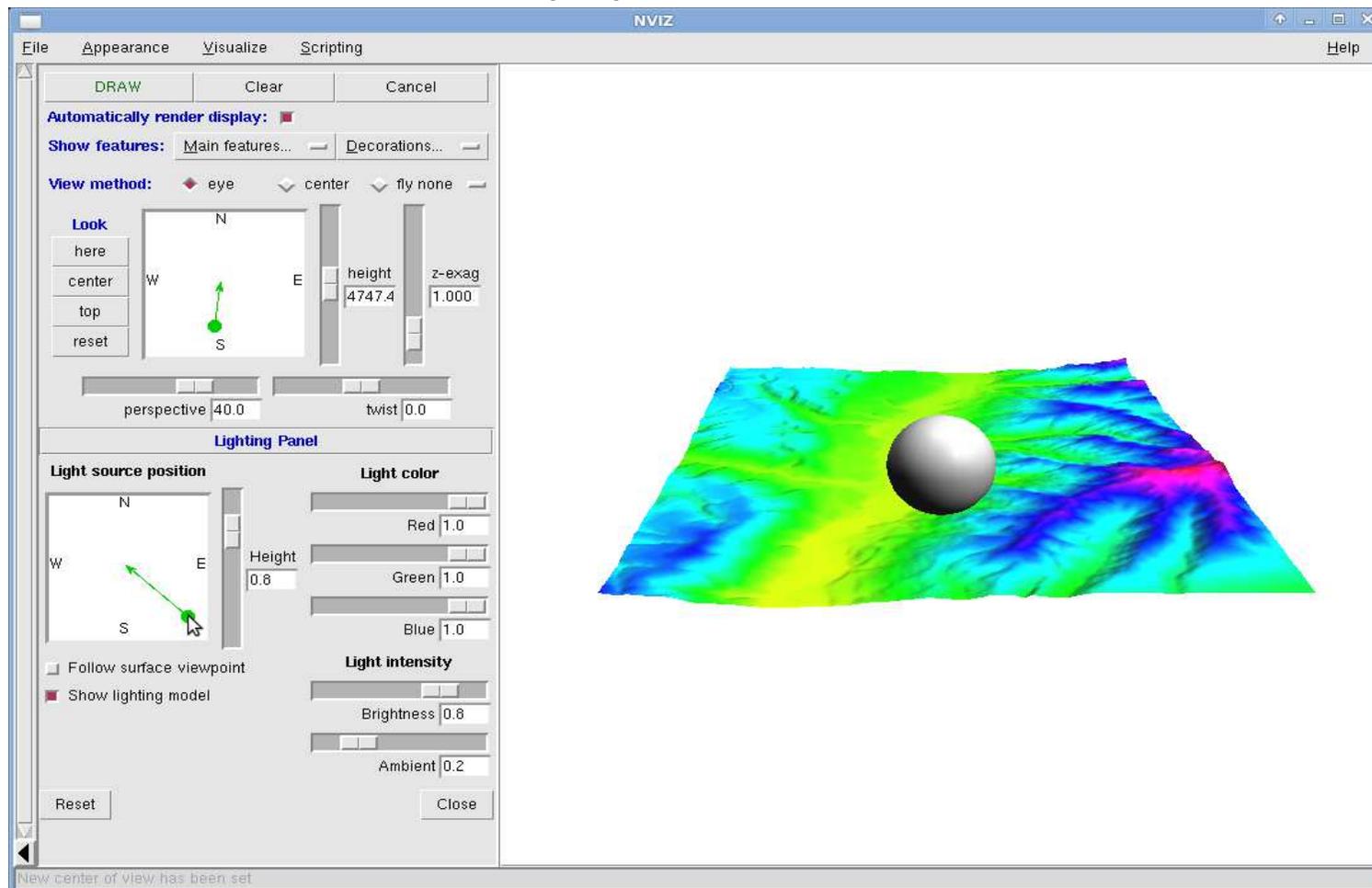
Light intensity: modifica intensitatea luminii



Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Schimbarea proprietatilor de vizualizare

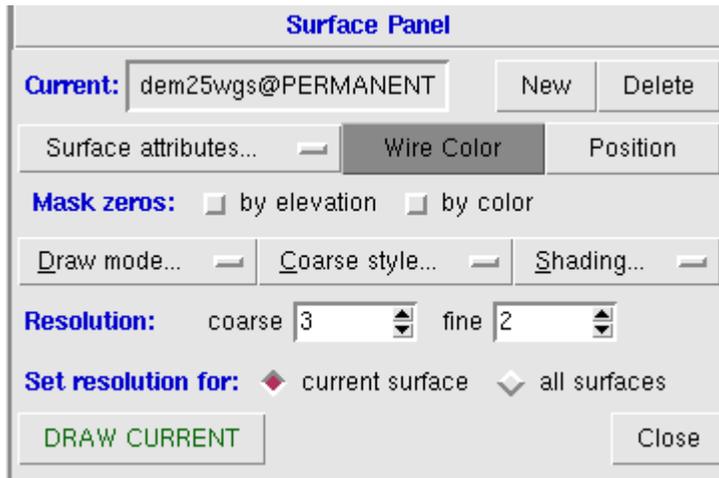


Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Intersectarea suprafeței cu un plan orizontal

Se utilizează opțiunea Surface panel: Vizualize > Raster Surface



Current: stratul asupra căruia se fac modificări

Surface attributes: modificarea atributelor suprafeței

Resolution: creșterea/scăderea rezoluției

DRAW CURRENT: se aplică după fiecare modificare

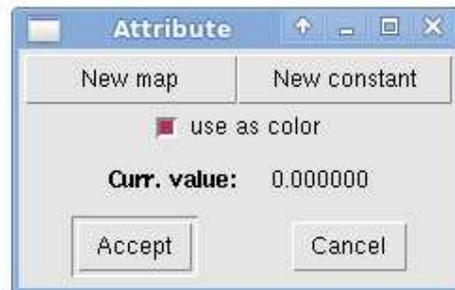


Manipularea datelor in GRASS

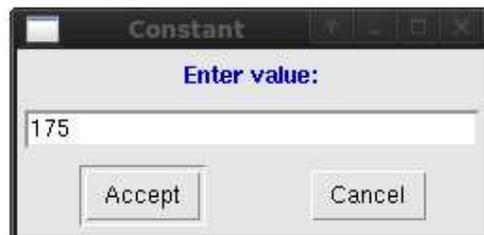
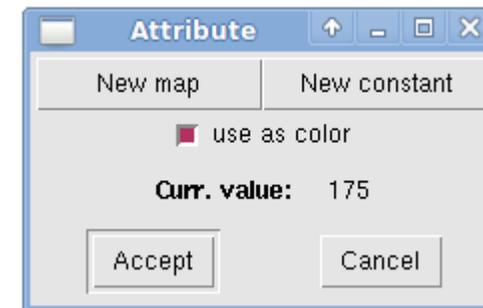
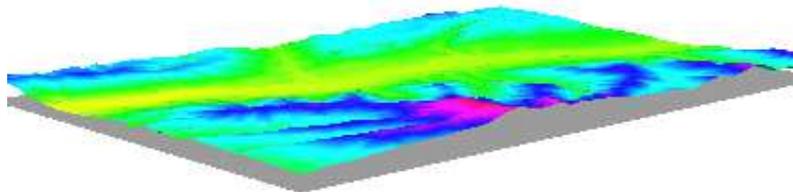
Interogarea datelor raster - Vizualizare 3D

Intersectarea suprafeței cu un plan orizontal

Introducem planul de sectionare: New > New Constant



New Constant : Adauga proprietatea Z planului
Constant : se introduce valoarea Z



Dupa introducerea valorii, aceasta apare la optiunea:
Curr.value (in cazul nostru 175)

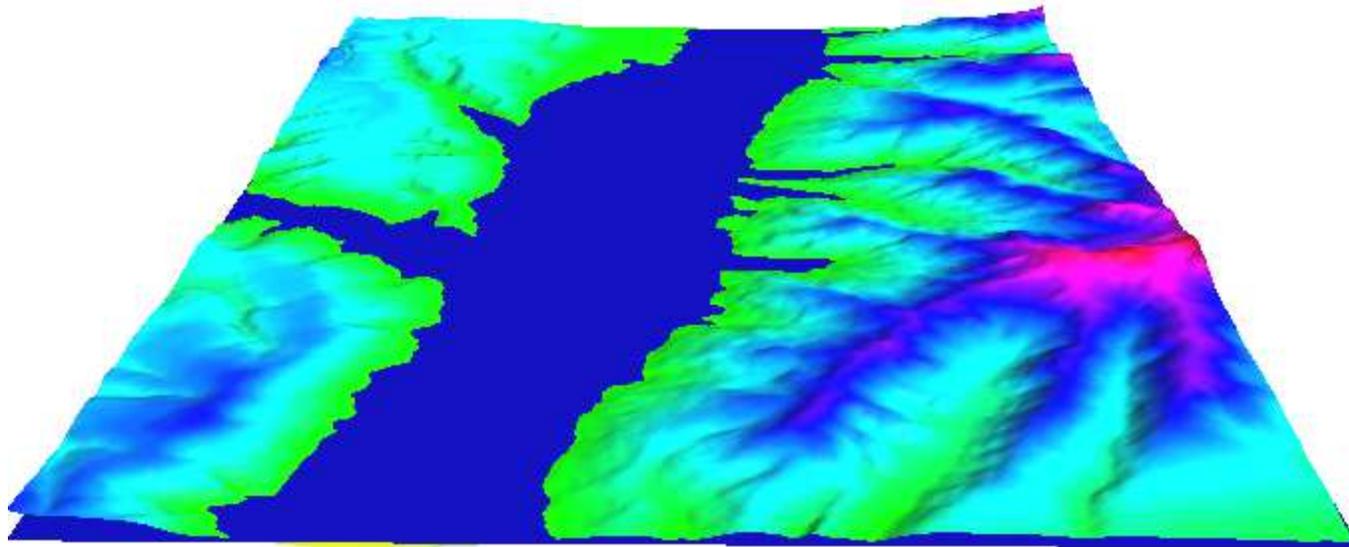


Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Intersectarea suprafeței cu un plan orizontal

Rezultatul final:



Manipularea datelor in GRASS

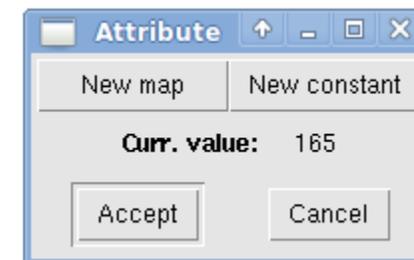
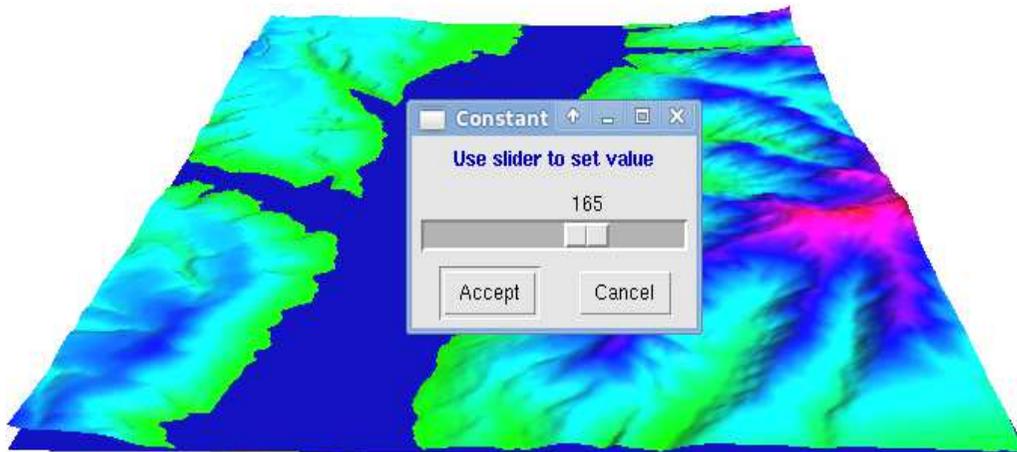
Interogarea datelor raster - Vizualizare 3D

Intersectarea suprafeței cu un plan orizontal

Schimbarea transparenței stratului creat: `Surface attributes... > transparency`



New Constant : Adauga transparenta planului
Constant : se introduce valoarea transparenței



Dupa introducerea valorii, aceasta apare la optiunea:
`Curr.value` (in cazul nostru 165)

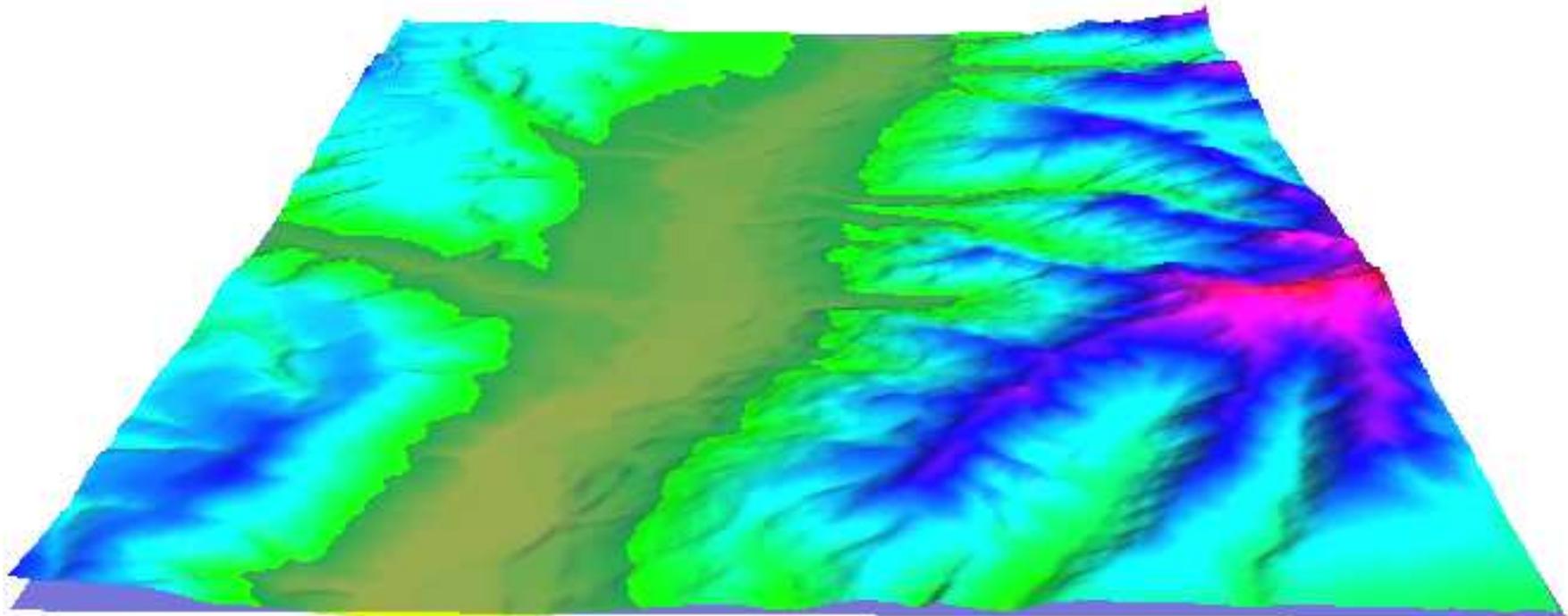


Manipularea datelor in GRASS

Interogarea datelor raster - Vizualizare 3D

Intersectarea suprafeței cu un plan orizontal

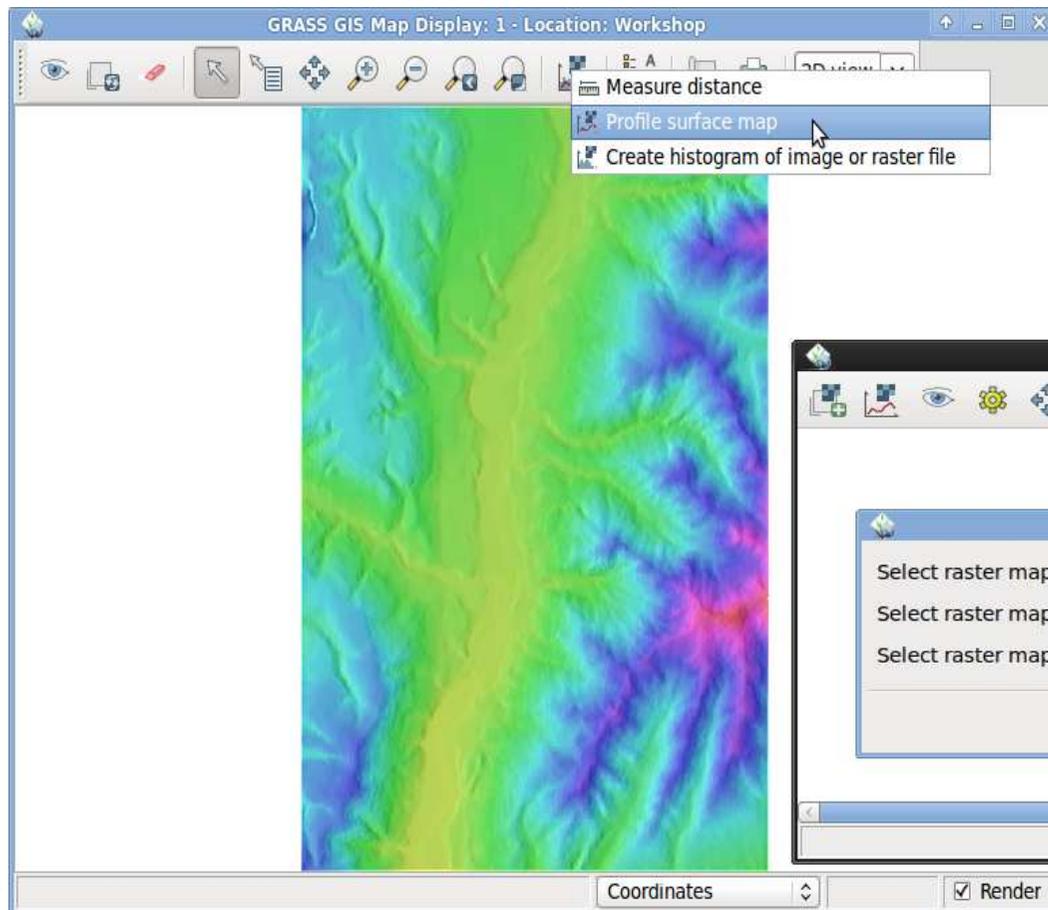
Rezultatul final:



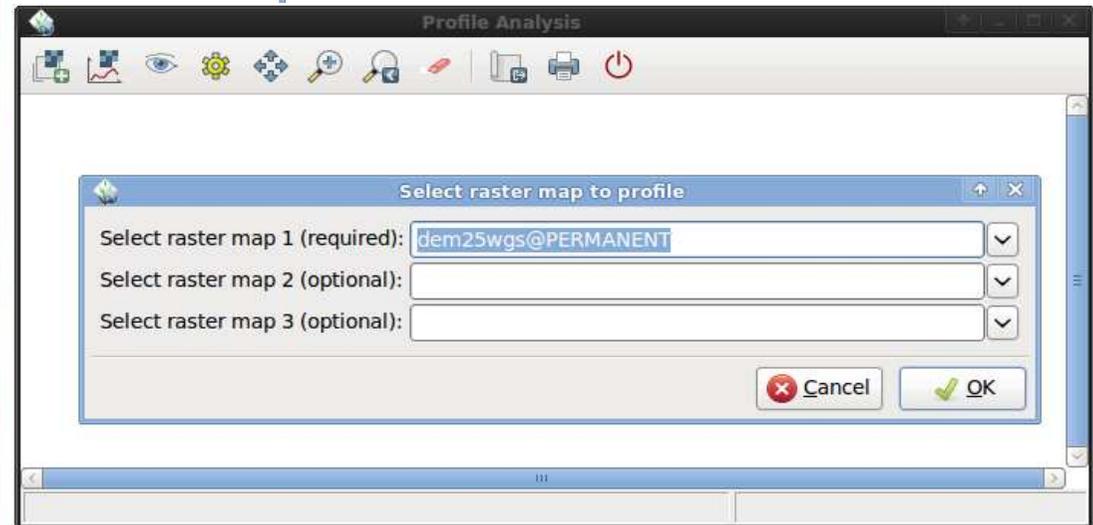
Manipularea datelor in GRASS

Interogarea datelor raster - profile

In fereastra de vizualizare alegem: Analyze > Profile surface map



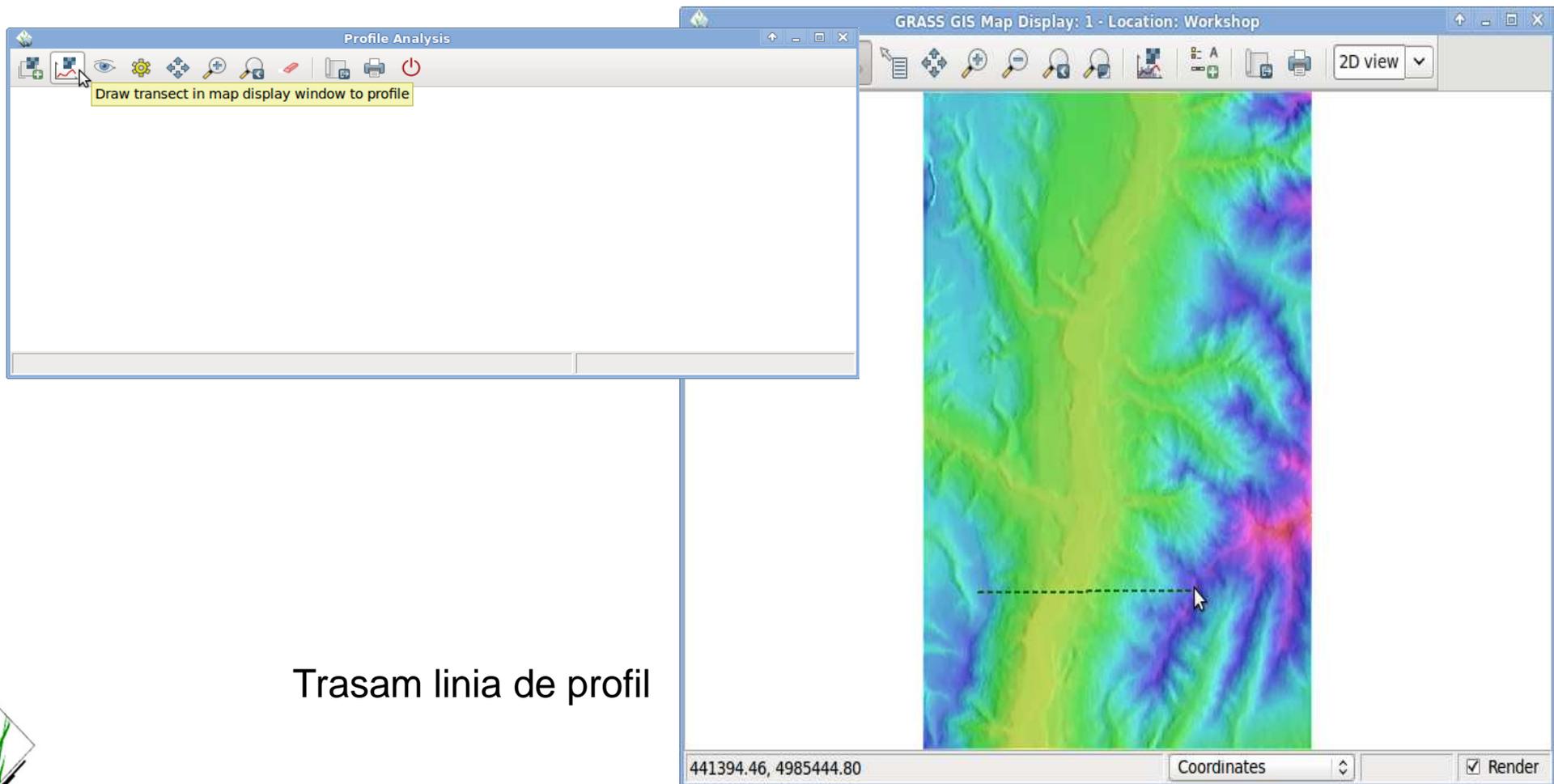
Selectam datele



Manipularea datelor in GRASS

Interogarea datelor raster - profile

In Profile Analysis alegem: Draw transect in map display window profile



The screenshot displays two windows from the GRASS GIS interface. The 'Profile Analysis' window on the left contains a toolbar with various icons and a tooltip that reads 'Draw transect in map display window to profile'. The 'GRASS GIS Map Display: 1 - Location: Workshop' window on the right shows a topographic map with a dashed line indicating a profile transect. The status bar at the bottom of the map display window shows the coordinates '441394.46, 4985444.80' and a 'Render' checkbox.

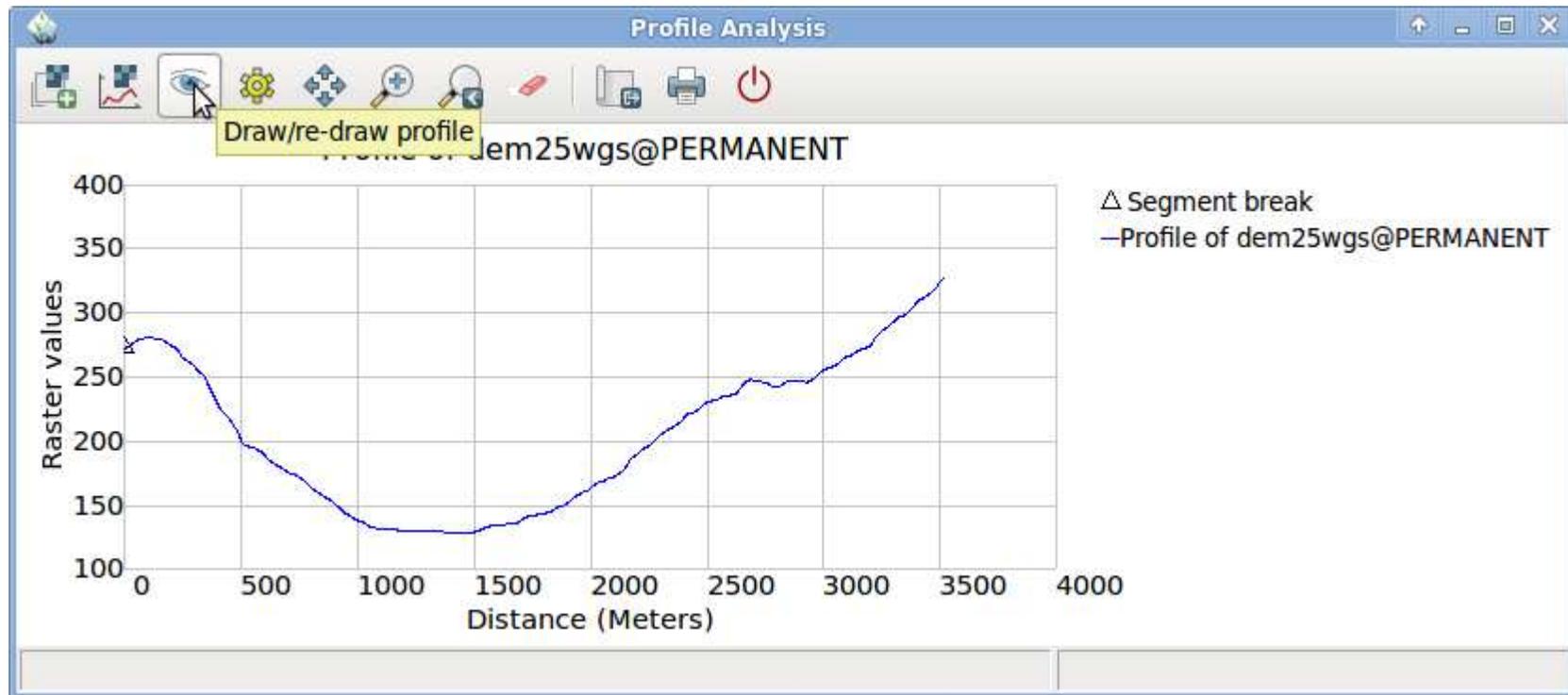
Trasam linia de profil



Manipularea datelor in GRASS

Interogarea datelor raster - profile

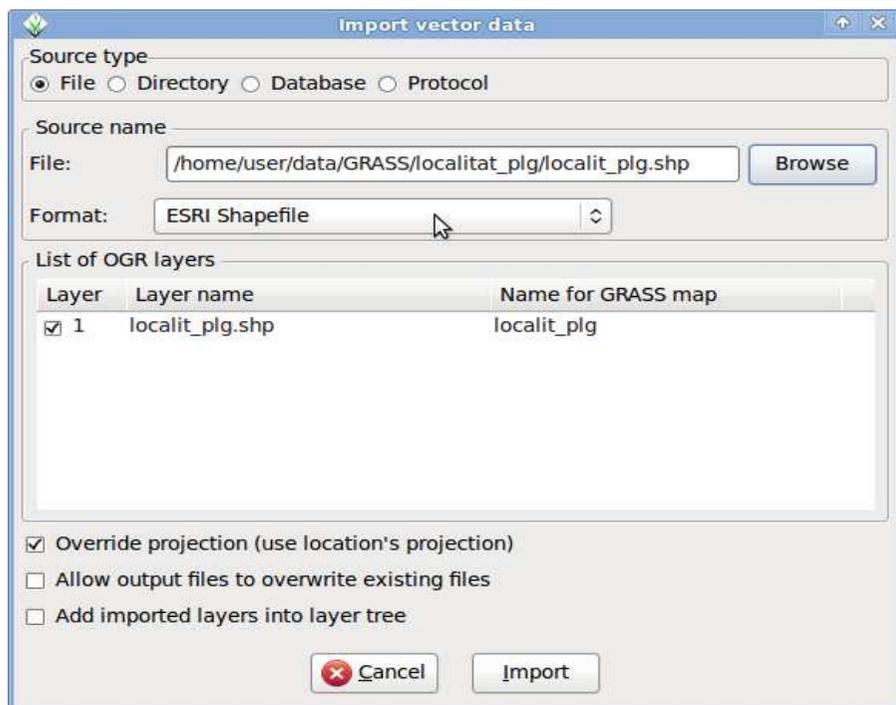
In fereastra Profile Analysis alegem: Draw/re-draw profile



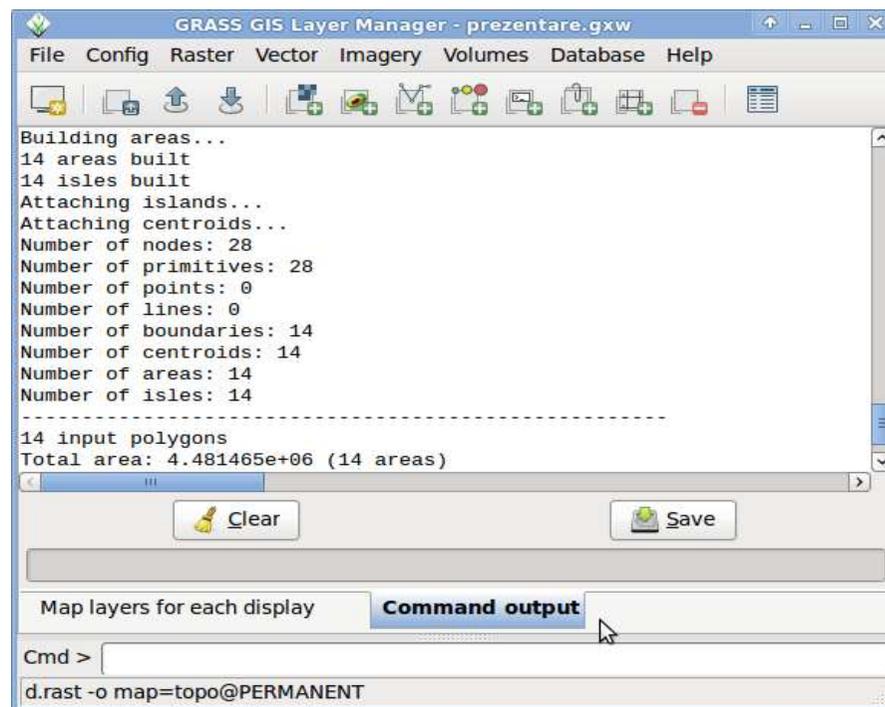
Manipularea datelor in GRASS

Importul datelor vectoriale

1. Selectam tipul de fisier: ESRI Shapefile
2. Selectam locatia: `home/user/data/GRASS/localit_plg/localit_plg.shp`
3. Apasam butonul: Import



In fereastra GIS Layer Manager, la optiunea Command output, va apare urmatorul mesaj:



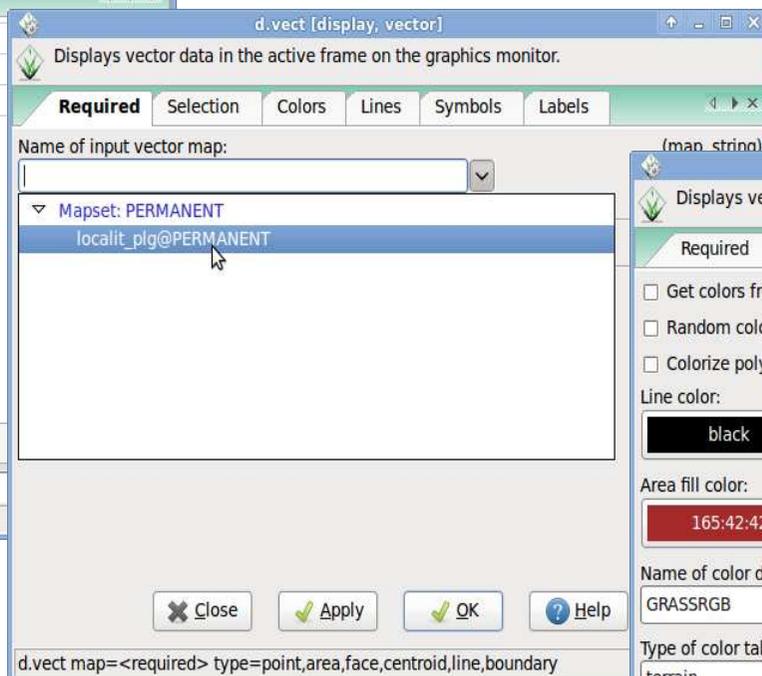
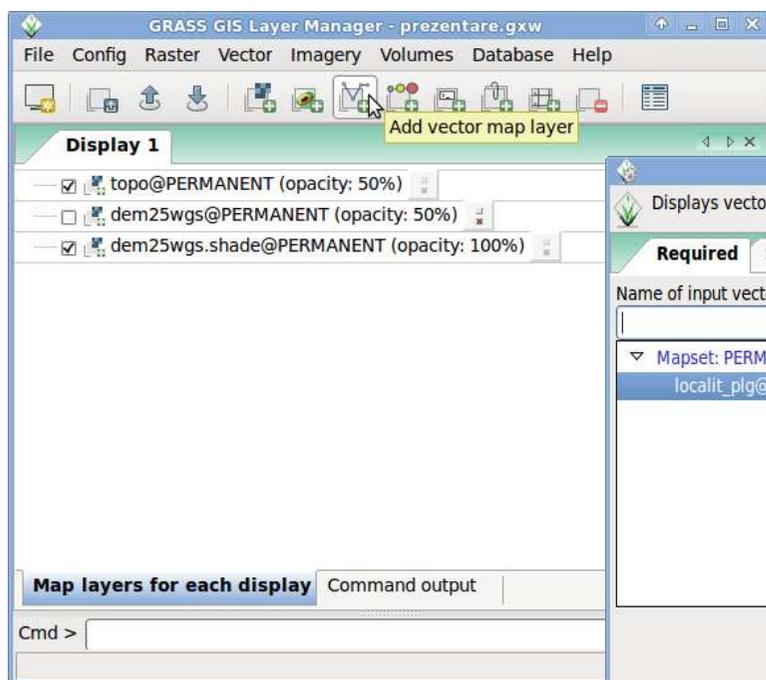
Manipularea datelor in GRASS

Importul datelor vectoriale

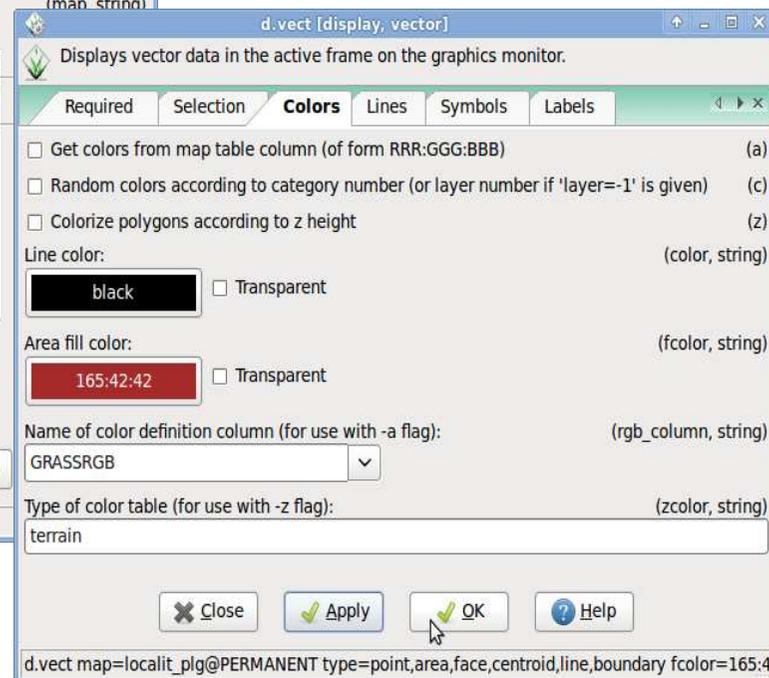
Accesam: Add vector map layer

Selectam: [dem25wgs@PERMANENT](#)

In fereastra Raster map to be displayed



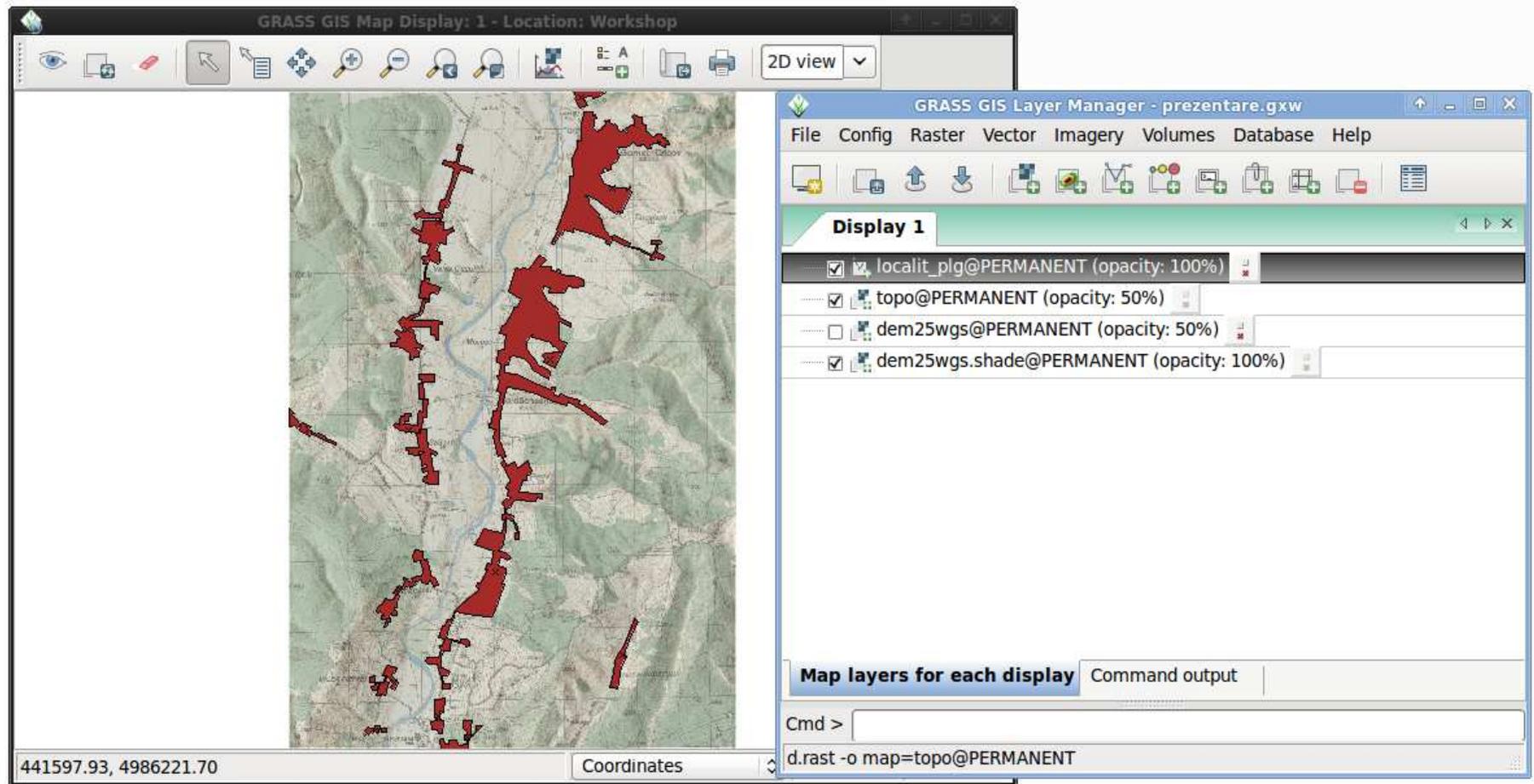
Apasam: Apply si OK



Manipularea datelor in GRASS

Importul datelor vectoriale

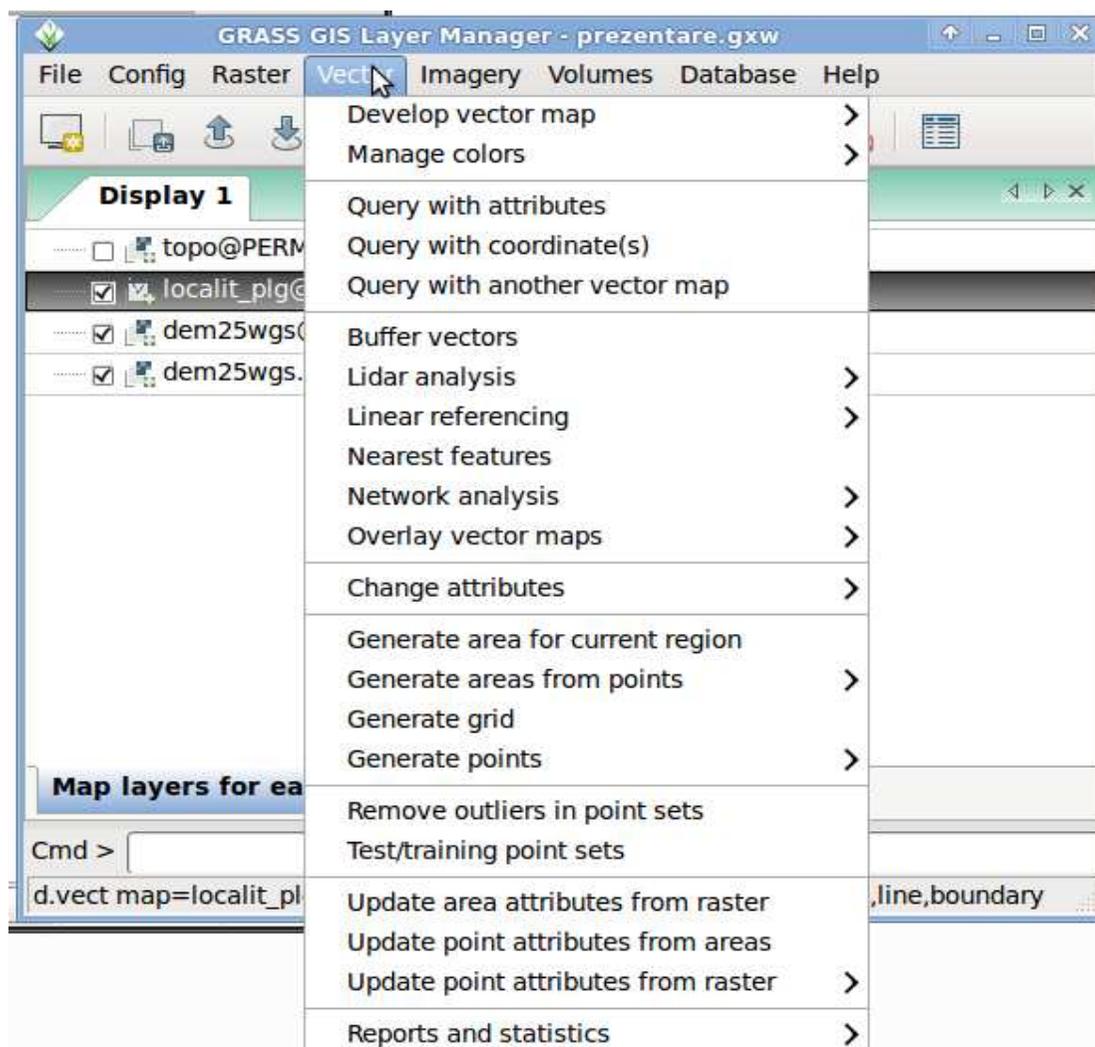
Rezultatul final:



Manipularea datelor in GRASS

Importul datelor vectoriale

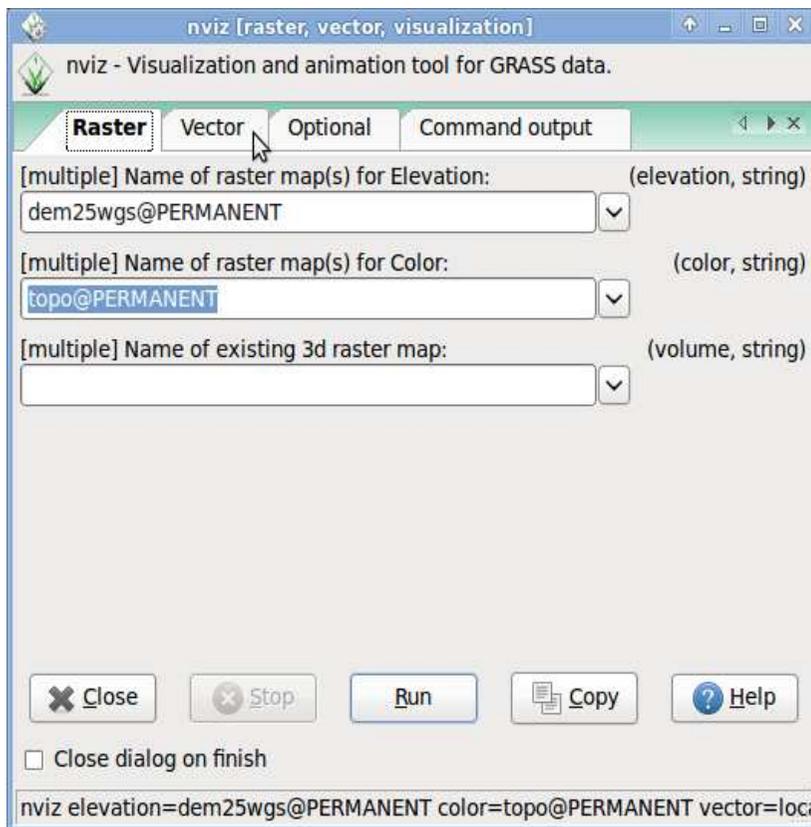
Optiuni pentru manipulare:



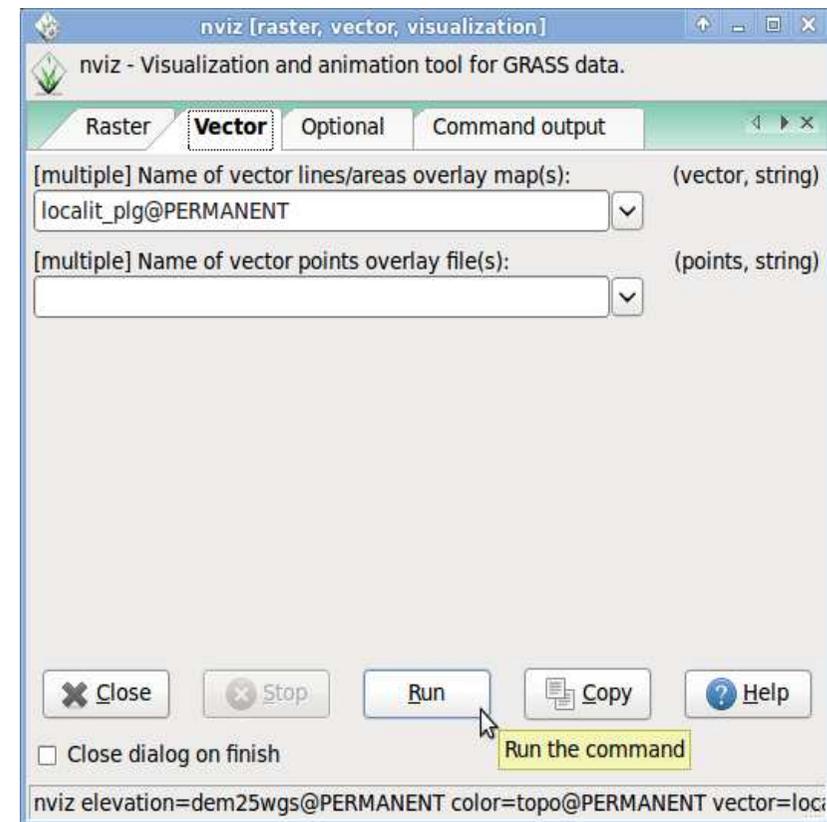
Manipularea datelor in GRASS

Importul datelor vectoriale

Vizualizare 3D – alegerea datelor de intrare:



Selectarea datelor raster:



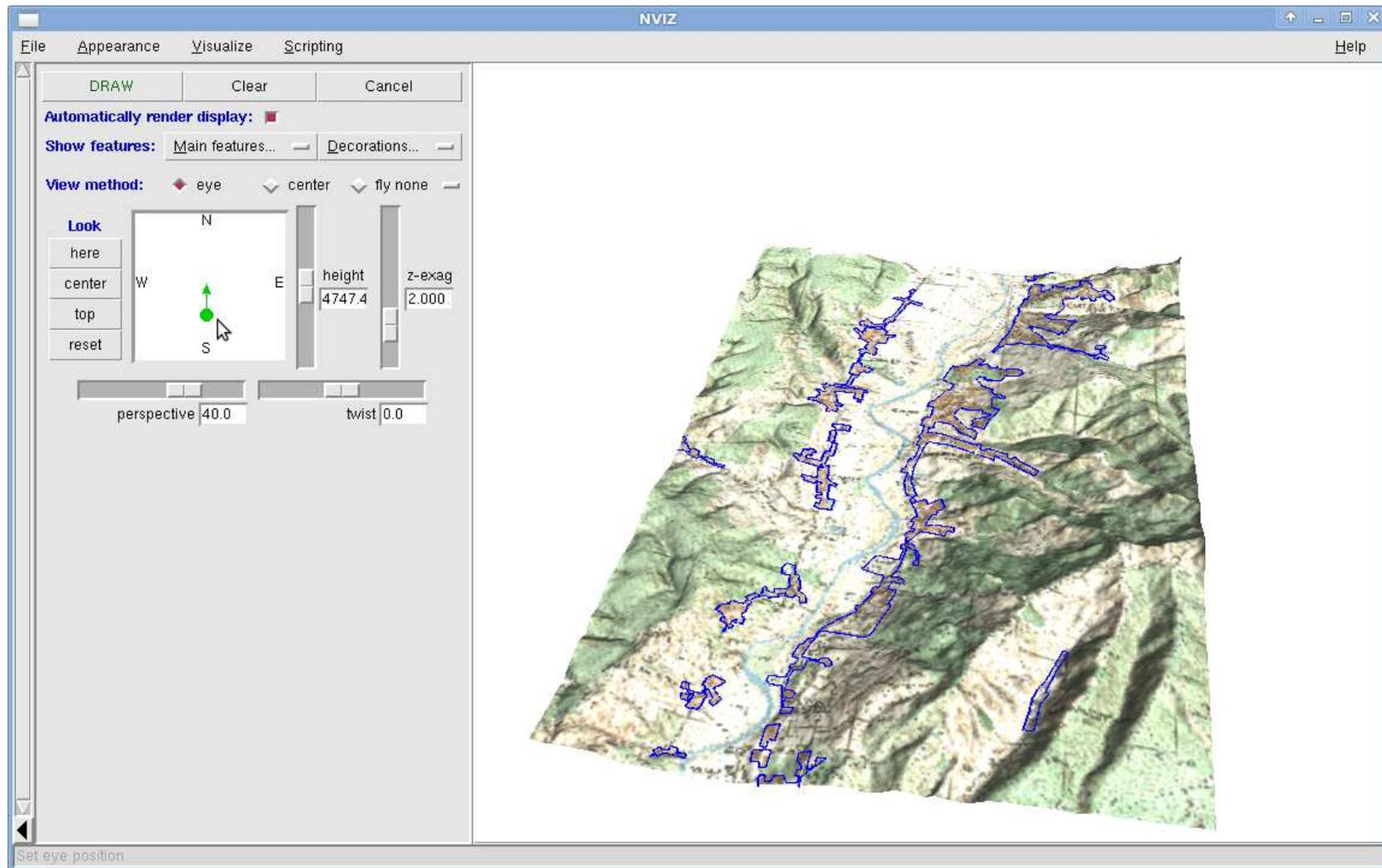
Selectarea datelor vectoriale:



Manipularea datelor in GRASS

Importul datelor vectoriale

Vizualizare 3D – rezultatul final:





Manipularea datelor in GRASS

Importul imaginilor satelitare

Alegem: Import raster data > Bulk import of raster data

Date: /GRASS/landsat_etm+

Formatul ales:

National Imagery

Transmission Format

Importam pe rand benzile spectrale:

1, 2, 3, 4, 5 si 7:

L71183029_02920070727_B10.TIF

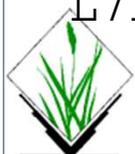
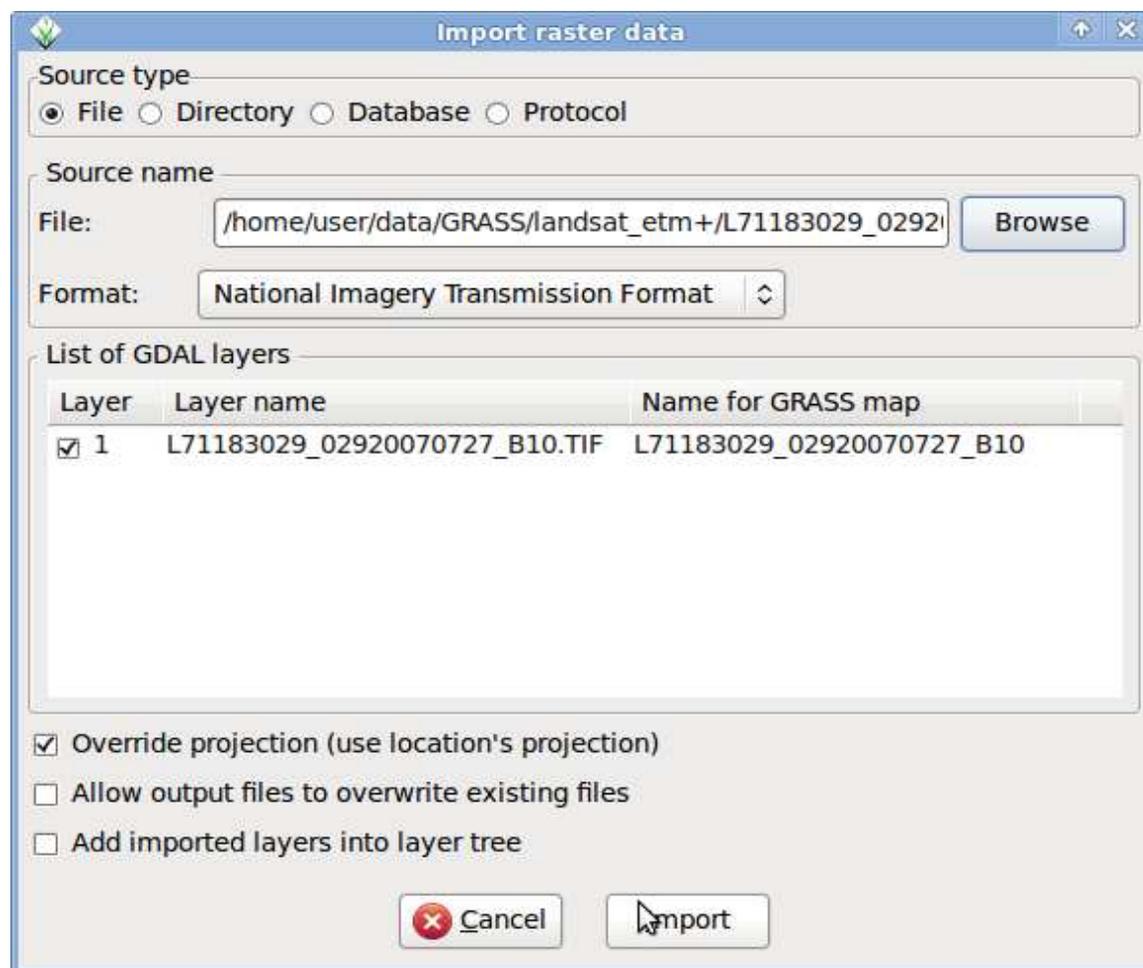
L71183029_02920070727_B20.TIF

L71183029_02920070727_B30.TIF

L71183029_02920070727_B40.TIF

L71183029_02920070727_B50.TIF

L71183029_02920070727_B70.TIF

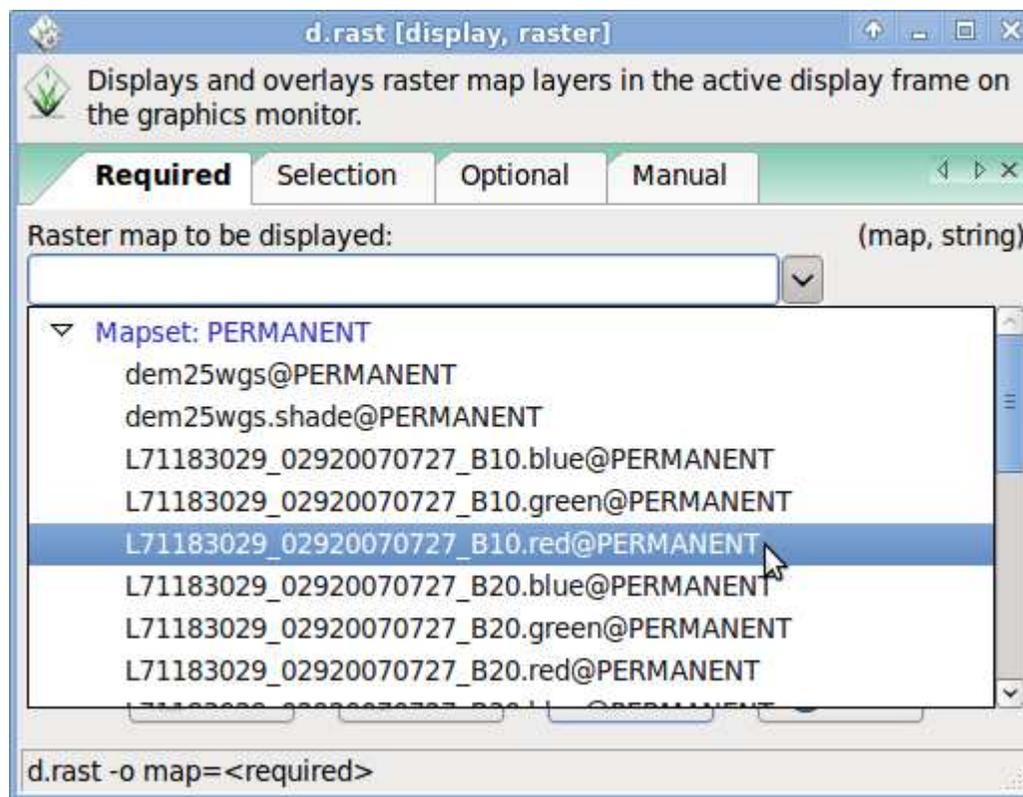


Manipularea datelor in GRASS

Importul imaginilor satelitare

Importul va crea pentru fiecare banda 3 imagini:

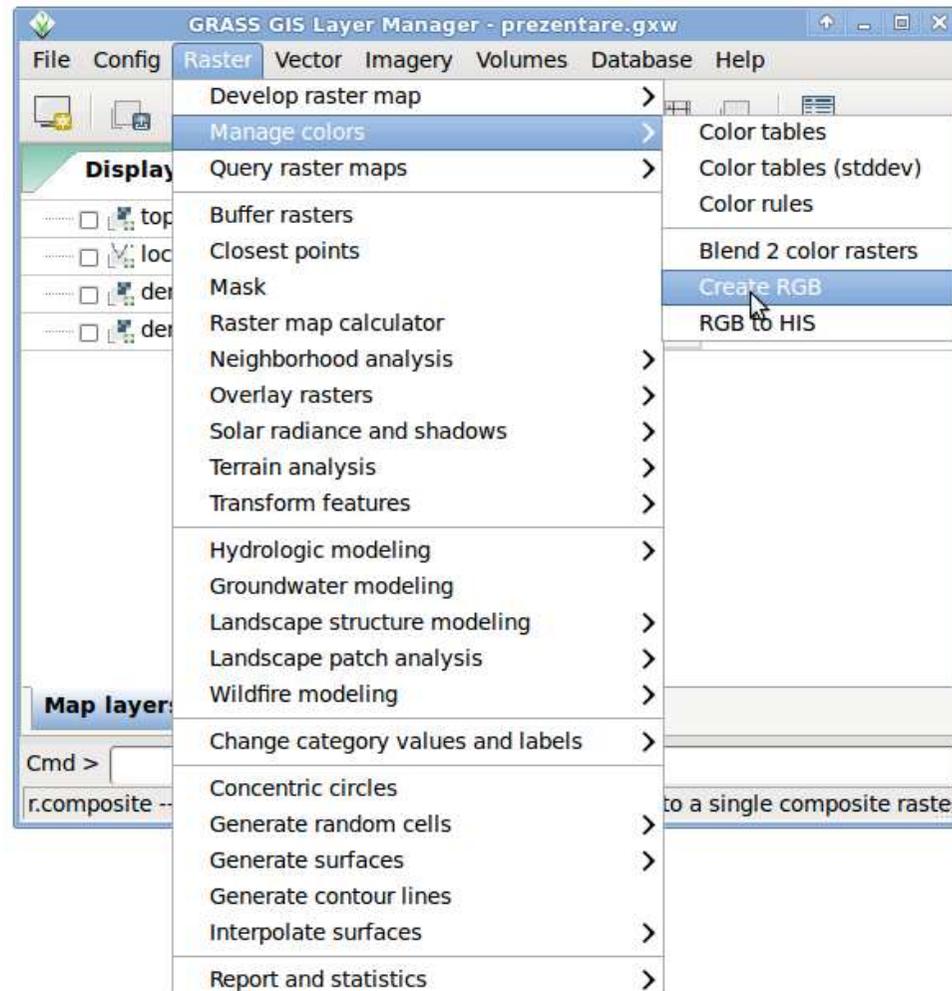
```
L71183029_02920070727_B10.blue@PERMANENT  
L71183029_02920070727_B10.green@PERMANENT  
L71183029_02920070727_B10.red@PERMANENT
```



Manipularea datelor in GRASS

Importul imaginilor satelitare

Executam comanda: Raster > Manage colors > Create RGB



Manipularea datelor in GRASS

Importul imaginilor satelitare

Alegem pentru fiecare strat banda dorit apasand butonul corespunzator.

Exemplu:

Red: L71183029_02920070727
Green: L71183029_02920070727
Blue: L71183029_02920070727

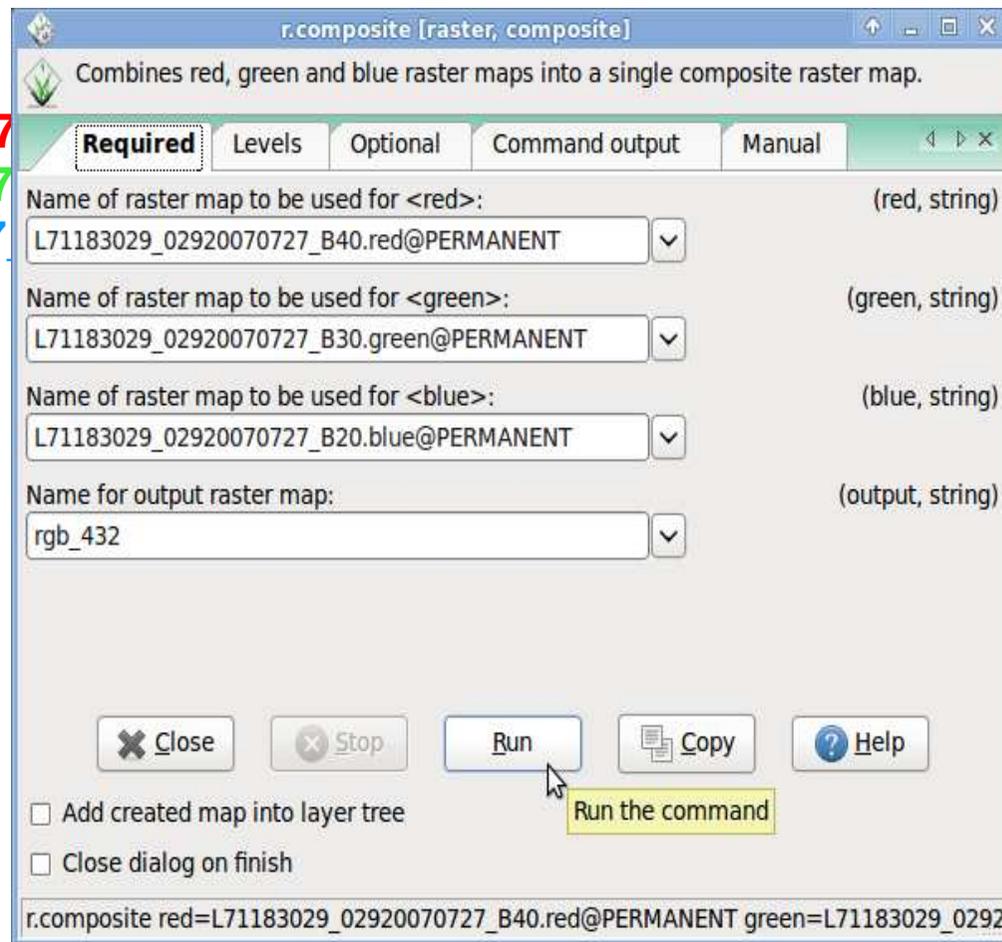
Completam numele imaginii de iesire:

```
> rgb_432
```

Adaugam rasterul creat

```
> Add raster map layer
```

Vizualizam rasterul



r.composite [raster, composite]

Combines red, green and blue raster maps into a single composite raster map.

Required Levels Optional Command output Manual

Name of raster map to be used for <red>: (red, string)
L71183029_02920070727_B40.red@PERMANENT

Name of raster map to be used for <green>: (green, string)
L71183029_02920070727_B30.green@PERMANENT

Name of raster map to be used for <blue>: (blue, string)
L71183029_02920070727_B20.blue@PERMANENT

Name for output raster map: (output, string)
rgb_432

Add created map into layer tree
 Close dialog on finish

Close Stop Run Copy Help

Run the command

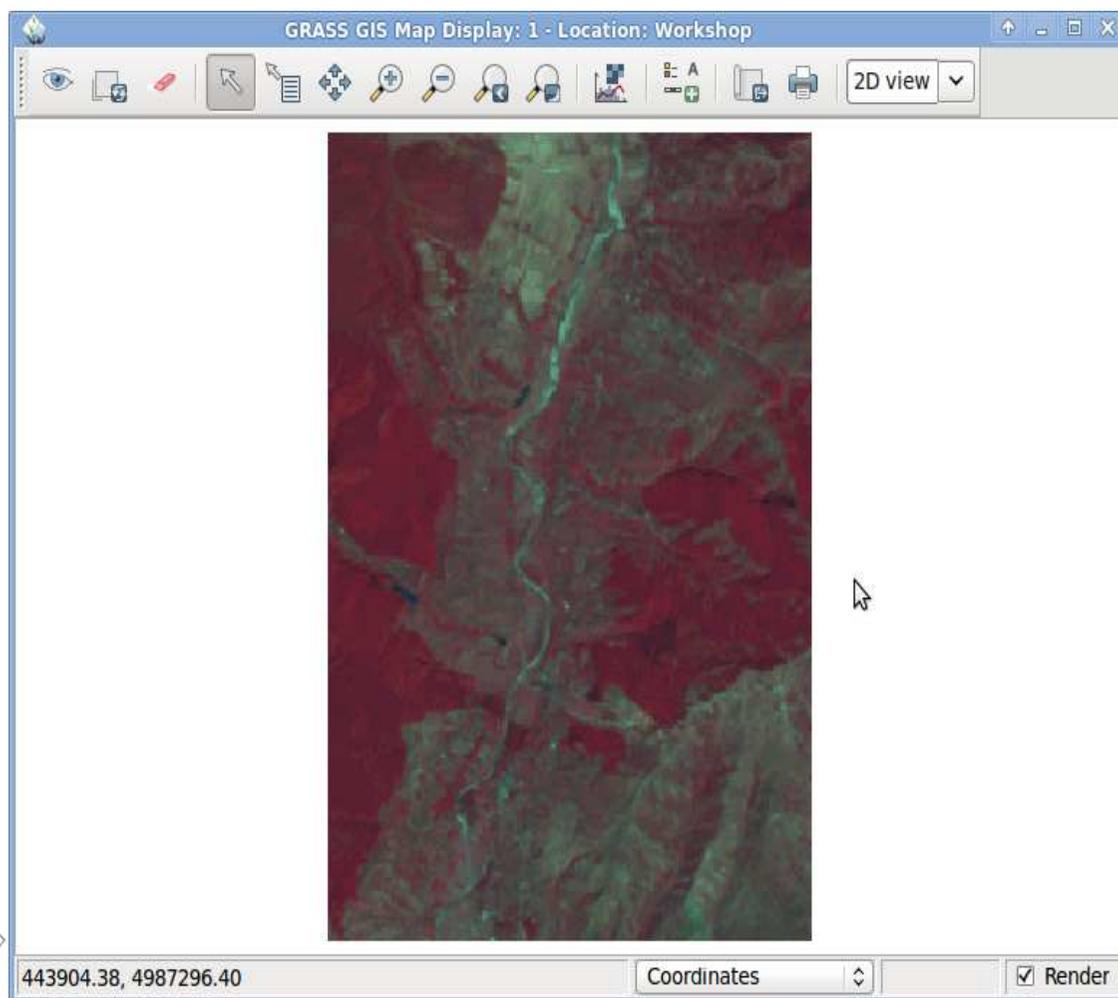
r.composite red=L71183029_02920070727_B40.red@PERMANENT green=L71183029_0292



Manipularea datelor in GRASS

Interogarea imaginilor satelitare

Combinatii de benzi:



Combinatia
spectrala

Caracteristici

4,3,2

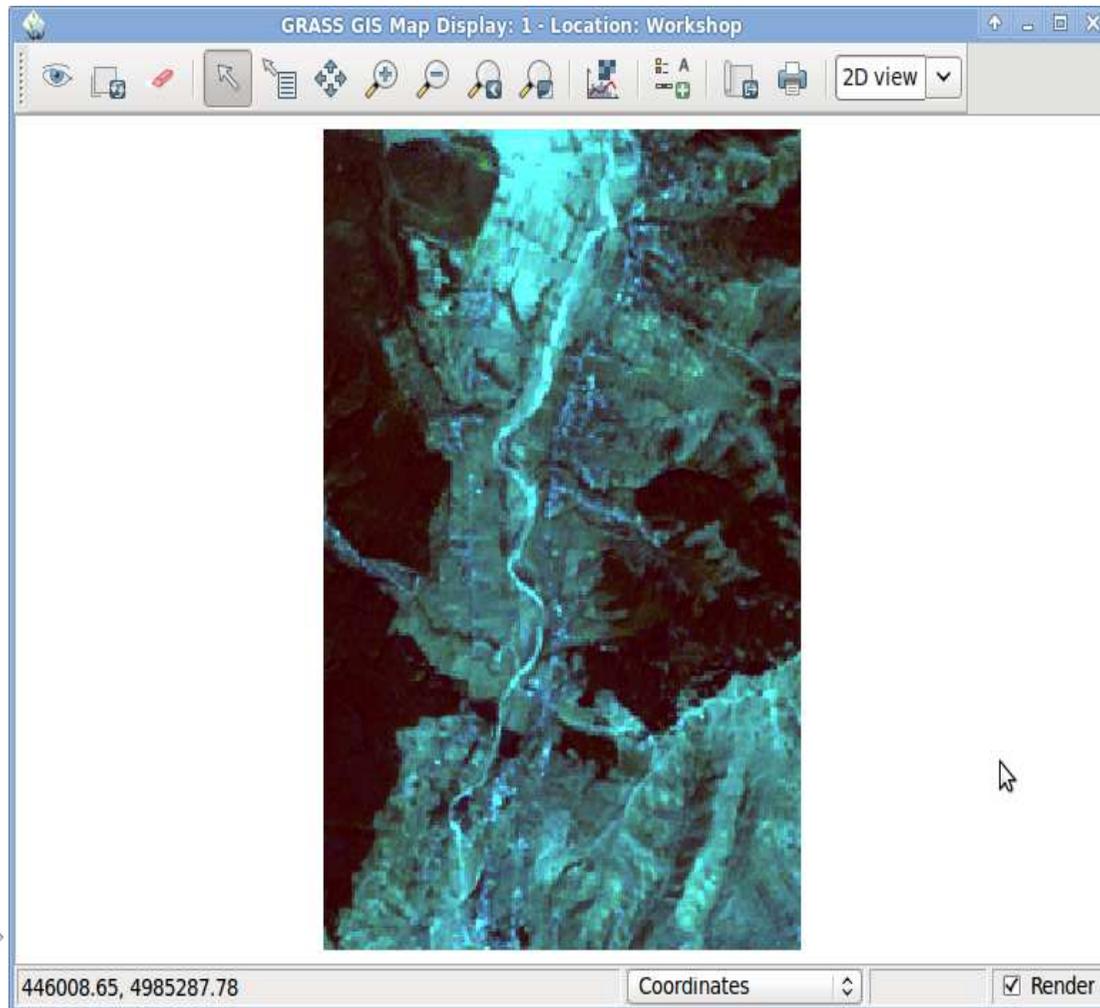
Vegetatie în
nuanțe de rosu,
zone urbane sunt
albastru cyan,
solicurile cu nuante
de maro



Manipularea datelor in GRASS

Interogarea imaginilor satelitare

Combinatii de benzi:



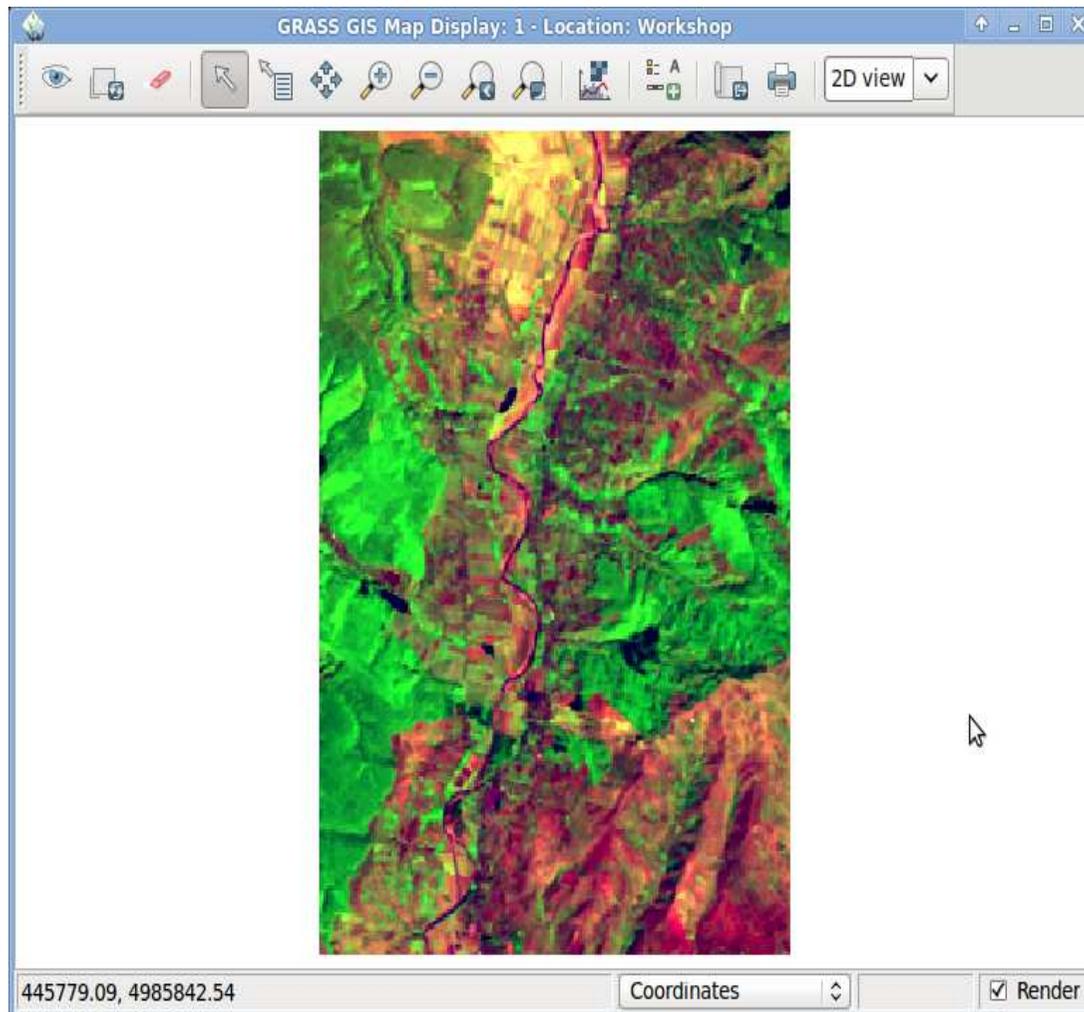
Combinatia spectrala	Caracteristici
3,2,1	Vegetatie în nuante de verde, zone urbane sunt albastru cyan,



Manipularea datelor in GRASS

Interogarea imaginilor satelitare

Combinatii de benzi:



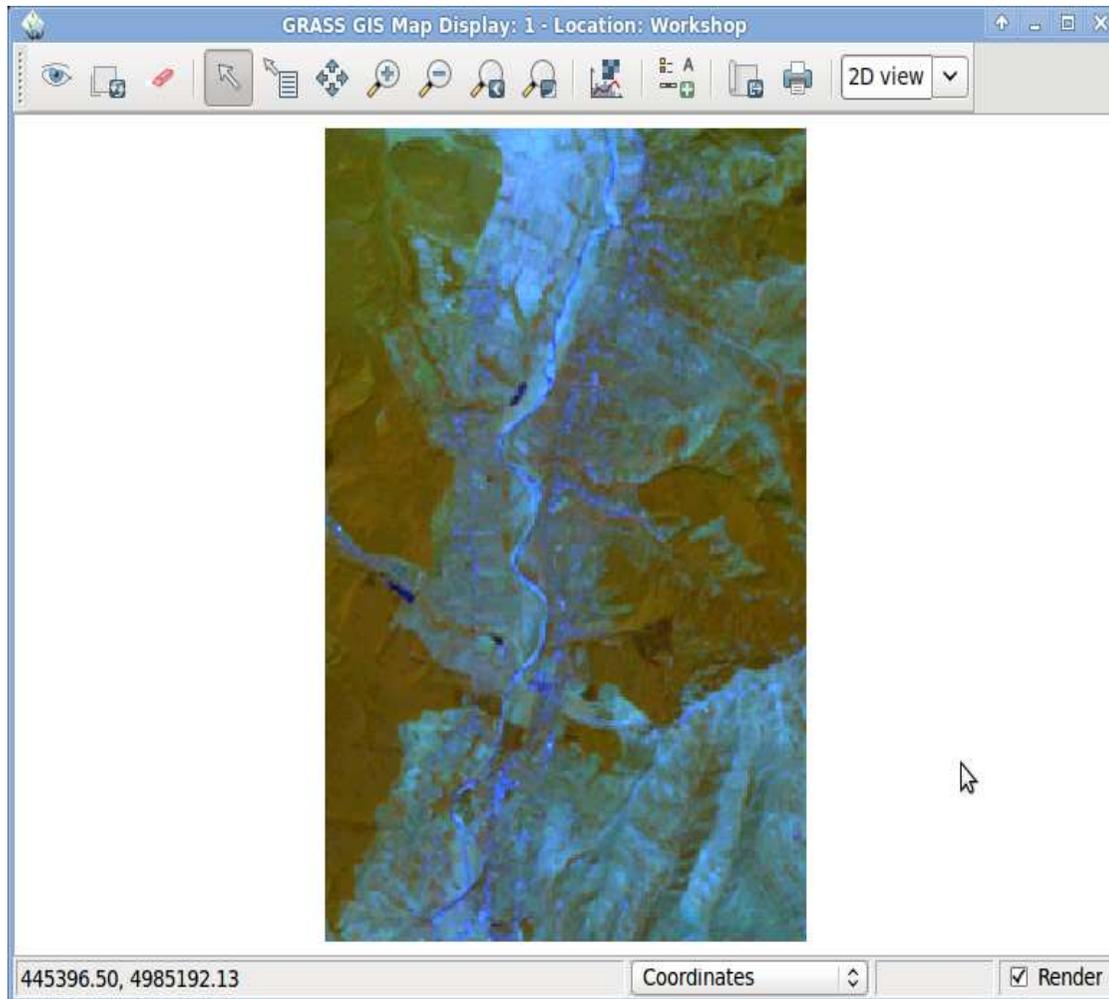
Combinatia spectrala	Caracteristici
7,4,2	Vegetatie în nuante de verde, aprins. Incendiile apar in rosu.



Manipularea datelor in GRASS

Interogarea imaginilor satelitare

Combinatii de benzi:



Combinatia spectrala	Caracteristici
4,5,1	Vegetatie în nuante de maro. Apa apare in albastru.



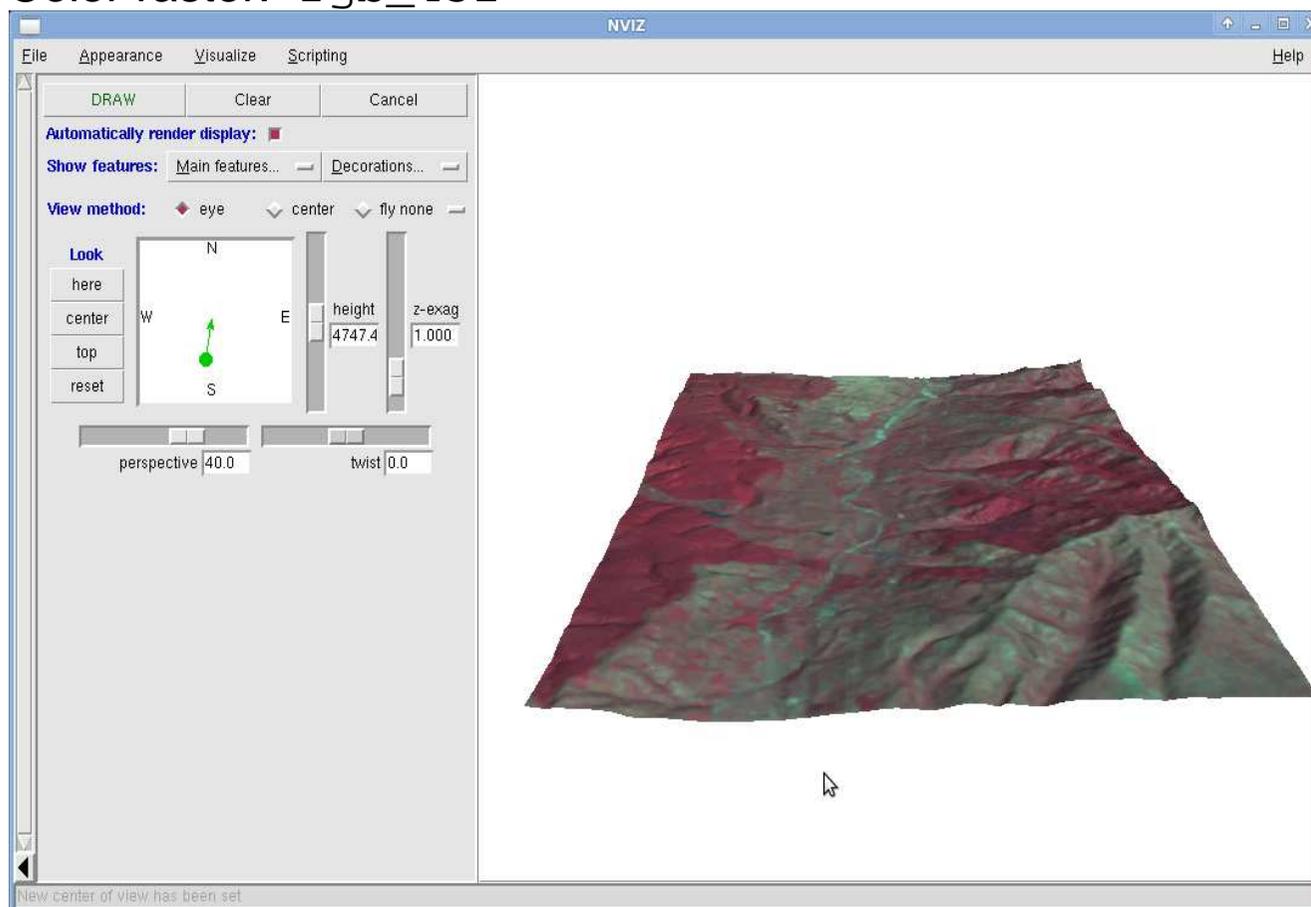
Manipularea datelor in GRASS

Interogarea imaginilor satelitare

Combinatia de benzi se poate vizualiza si in dormat 3D cu NVIZ

Elevation raster: `dem25wgs`

Color raster: `rgb_432`

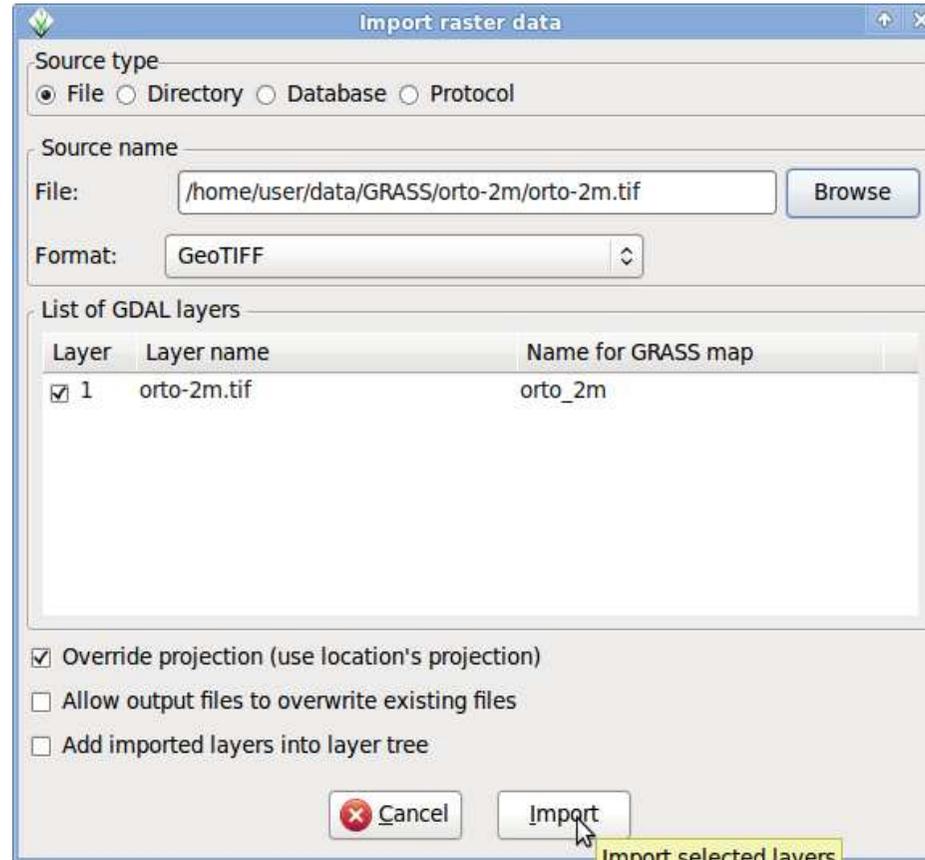


Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Importare ortofotoplan:

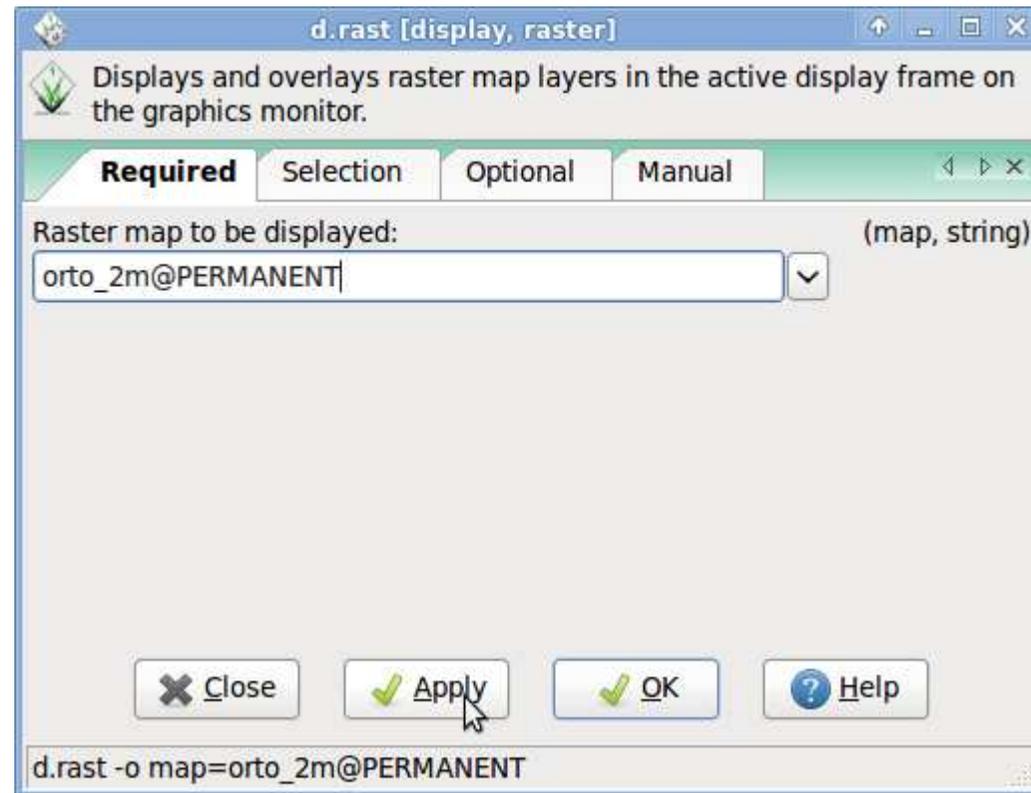
File > Import raster data > Bulk import of raster data



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Vizualizare ortofotoplan: Add raster map layer

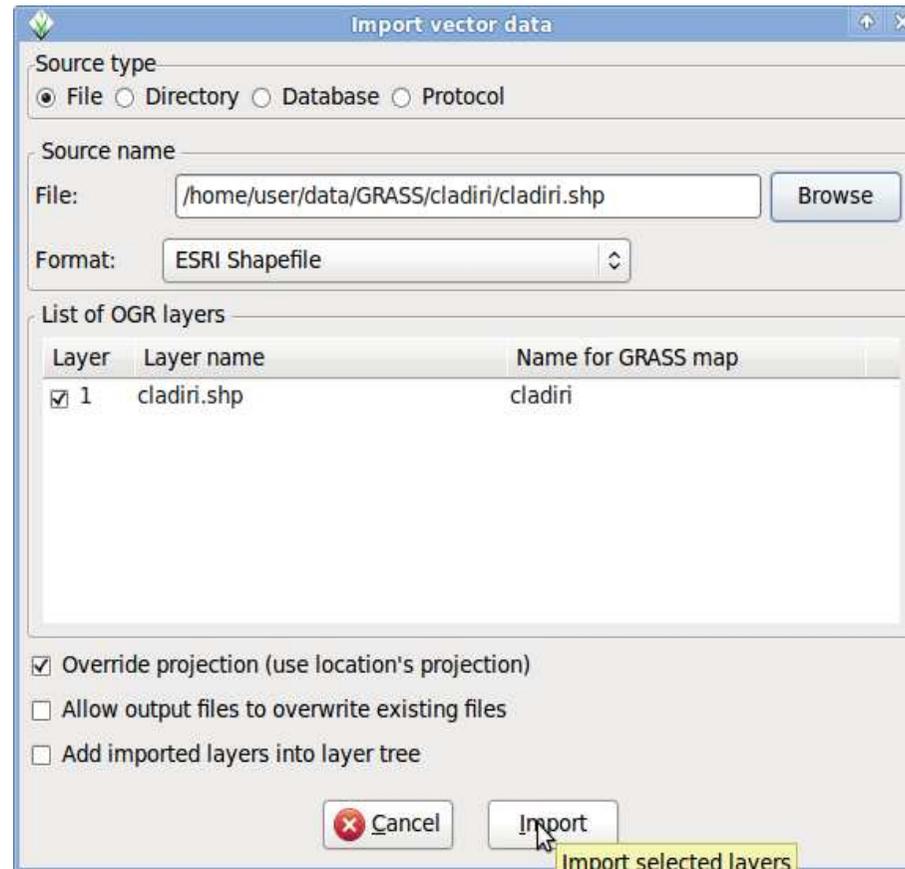


Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Importare cladiri:

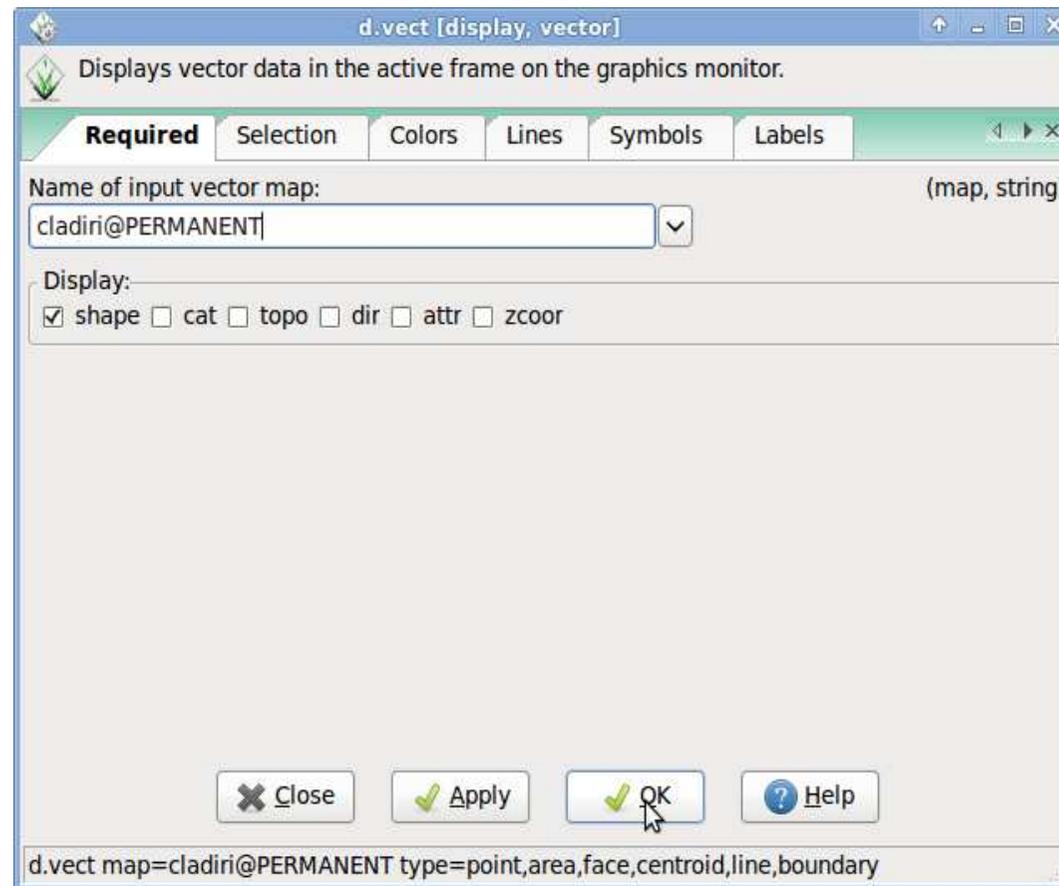
File > Import vector data > Bulk import of vector data



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

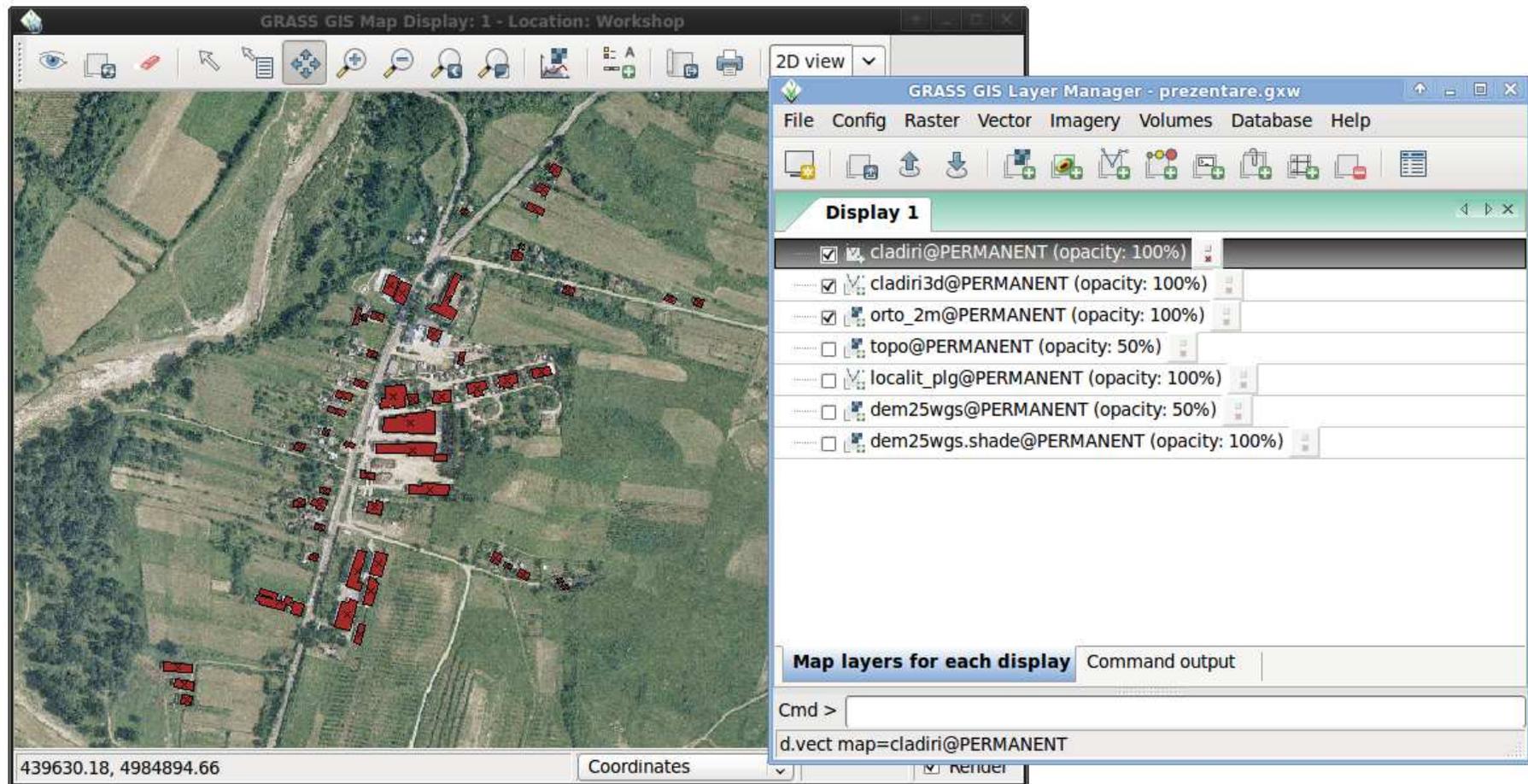
Vizualizare cladiri: Add vector map layer



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Rezultat:

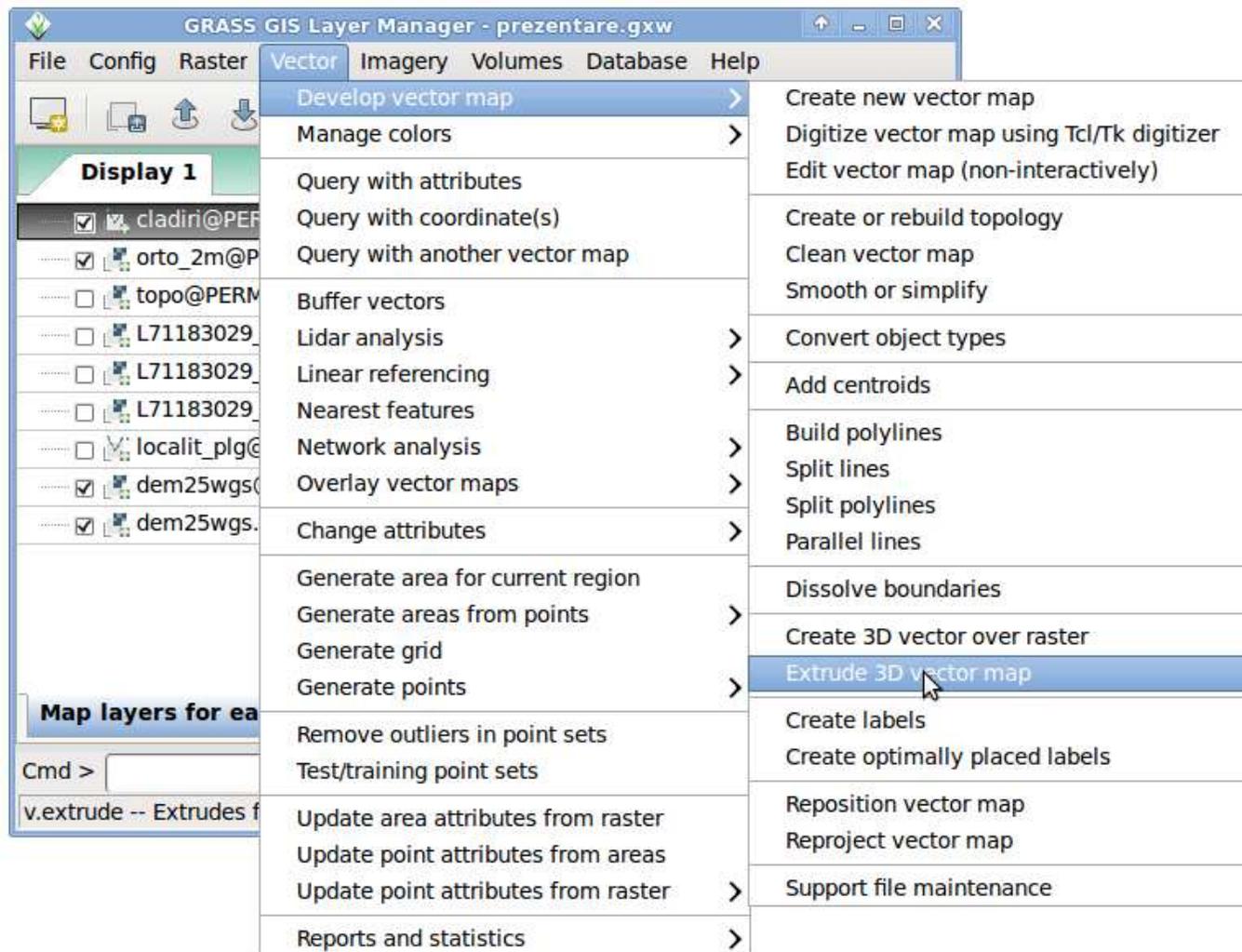


Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Realizarea cladirilor in 3D:

- > Vector
- > Develop vector map
- > Extrude 3D vector map



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

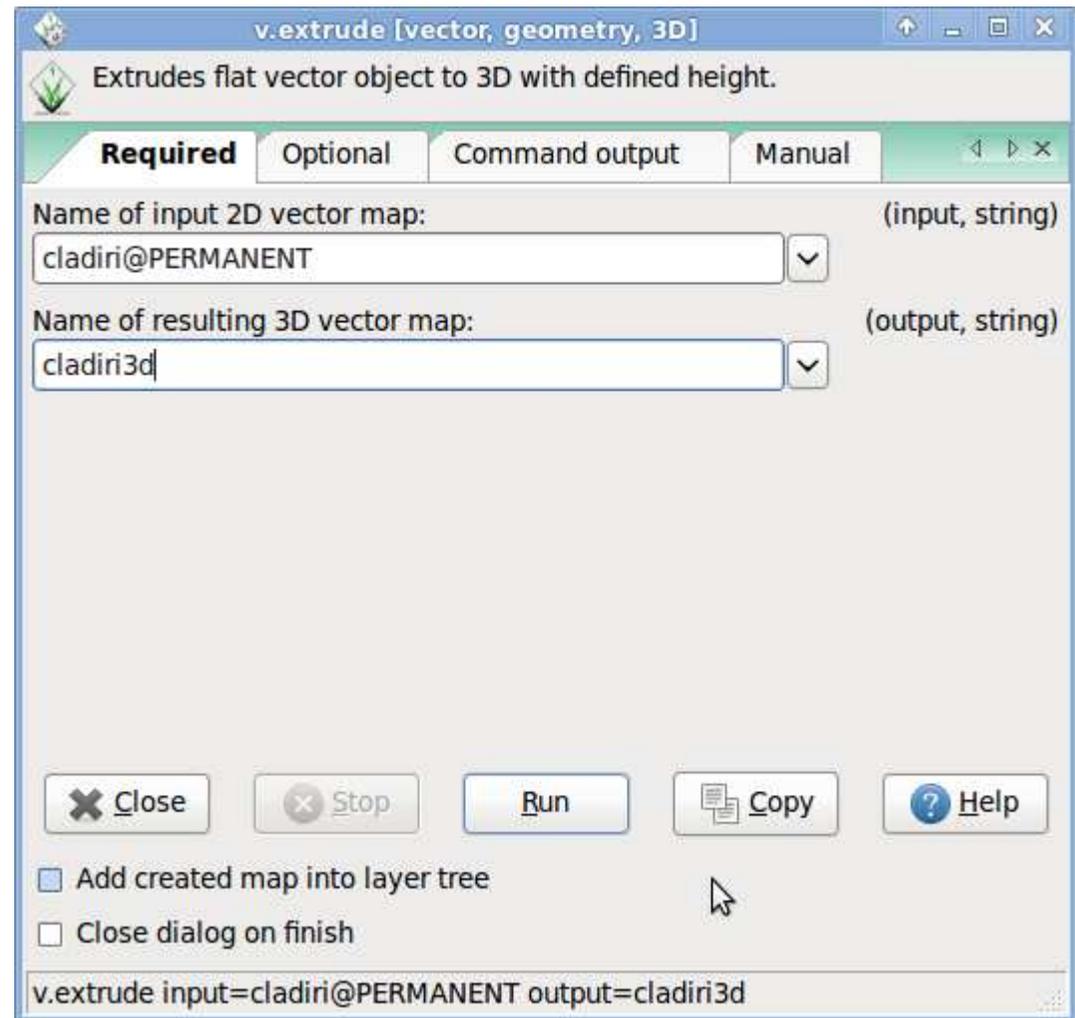
In fereastra v.extrude completam cerintele obligatorii:

Name on input vector map:

```
> cladiri@PERMANENT
```

Name of resulting 3D vector map

```
> cladiri3d
```



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

... precum si cerintele obtionale:

Bifam:

> Trace elevation

Elevation raster of height extraction

> dem25wgs@PERMANENT

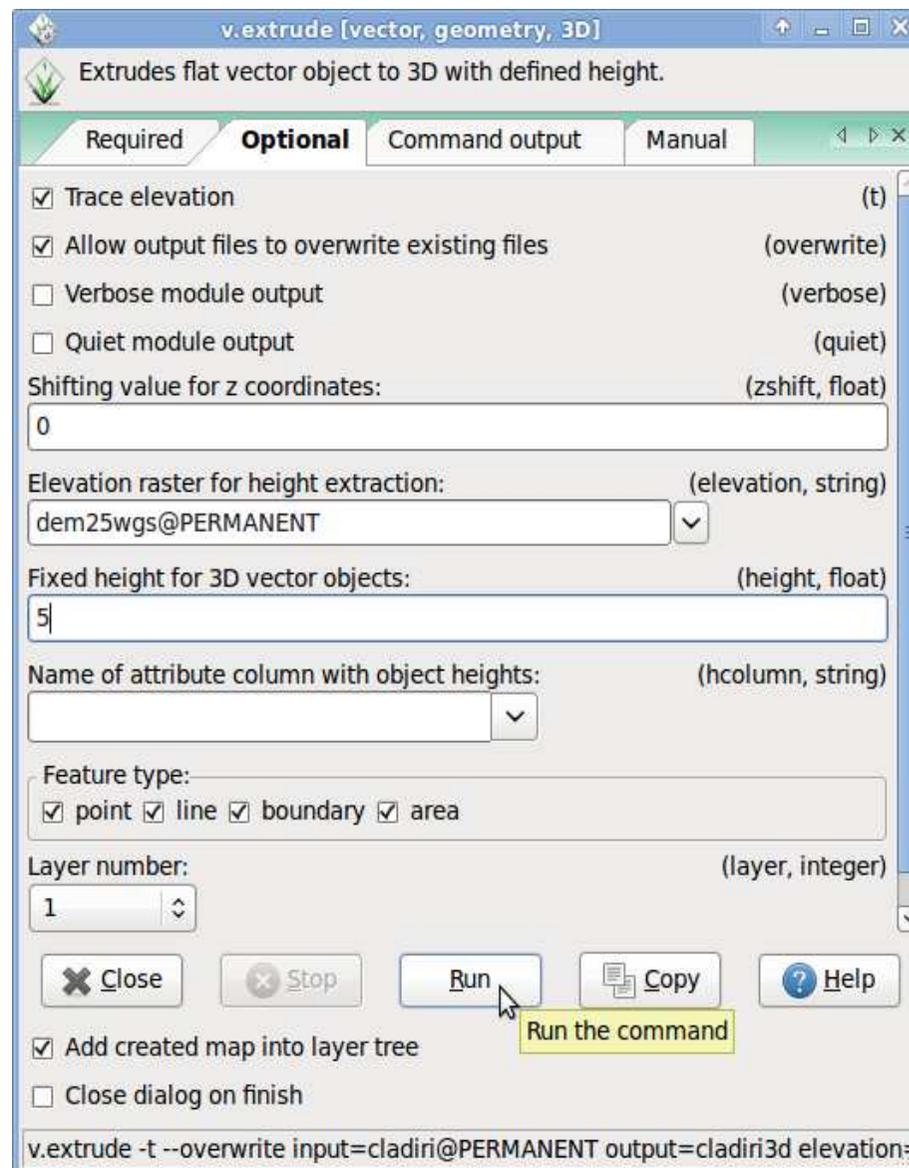
Fixed height for 3D vector objects:

> 5

Bifam:

> Add created map into layer tree

Rulam comanda



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

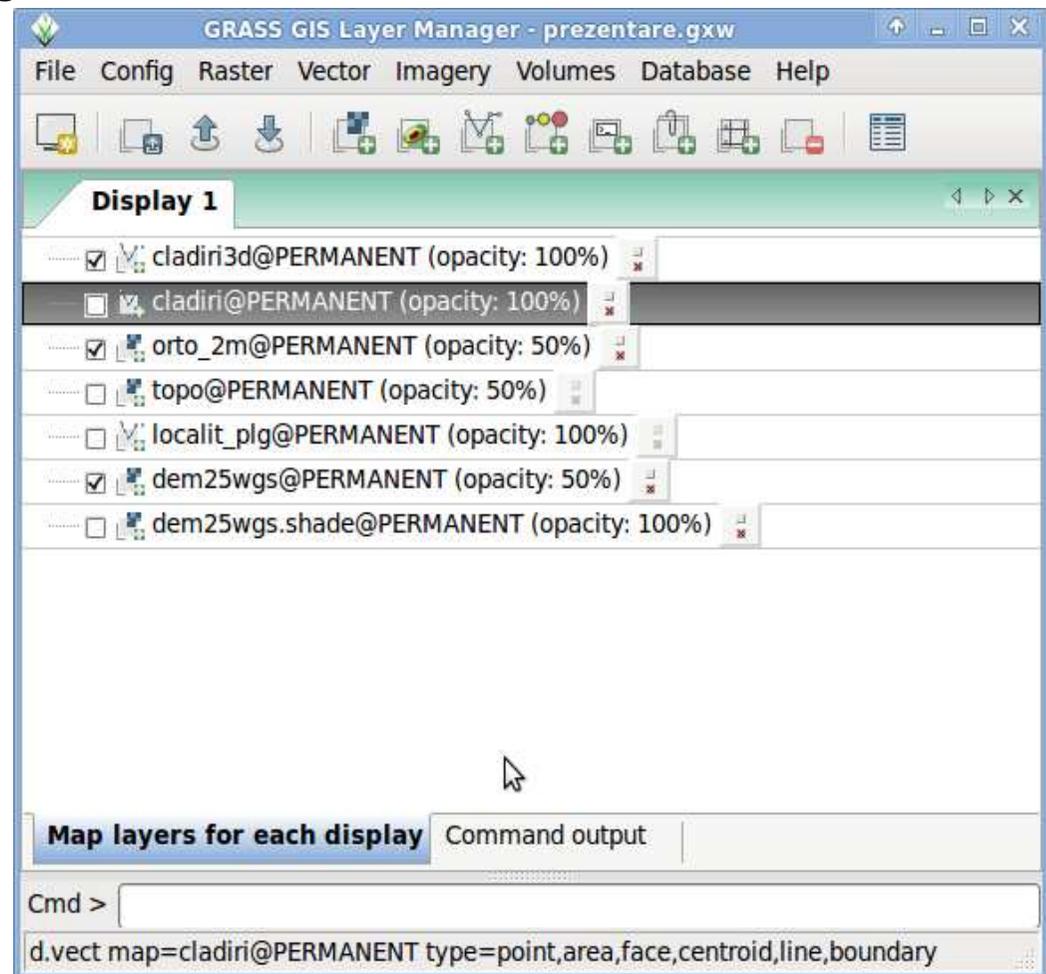
In fereastra GRASS GIS Layer Manager avem elementele:

Display1:

> cladiri3d@PERMANENT

> orto_2m@PERMANENT

> dem25wgs@PERMANENT



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Vizualizarea 3D: File > NVIZ

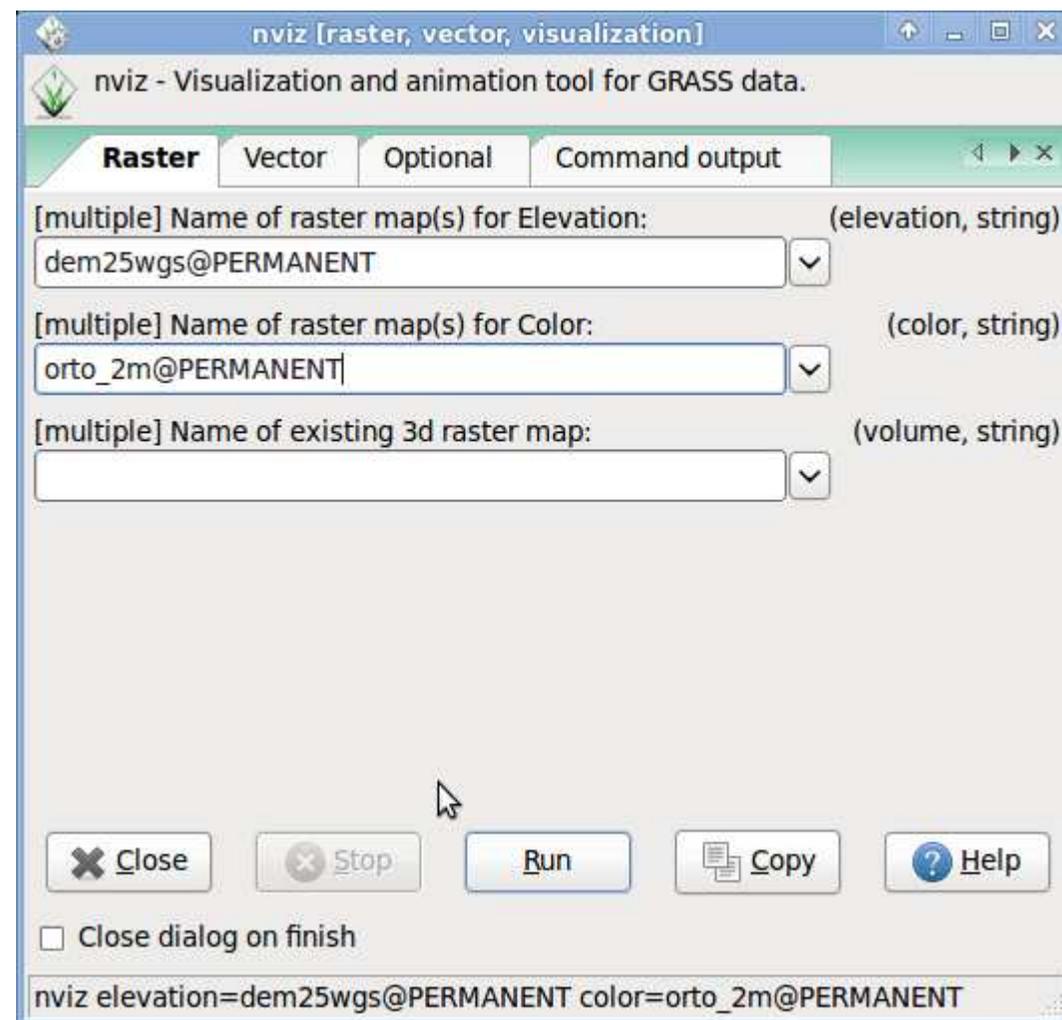
Completam datele raster:

Name of raster map(s) for Elevation:

> dem25wgs@PERMANENT

Name of raster map for Color:

> orto_2m@PERMANENT





Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

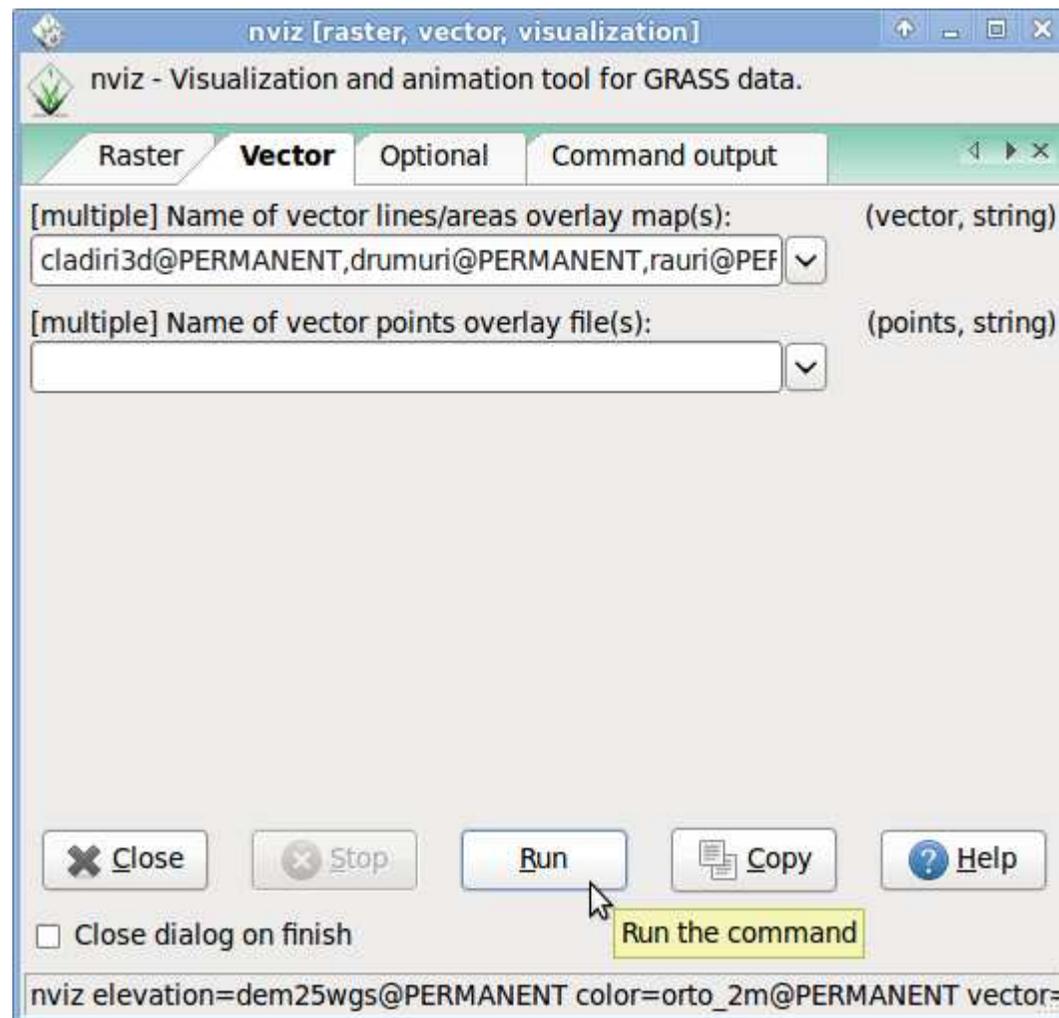
Vizualizarea 3D: File > NVIZ

Completam datele Vector:

Name of vector overlay map(s):

- > cladiri3d@PERMANENT
- > drumuri@PERMANENT
- > rauri@PERMANENT

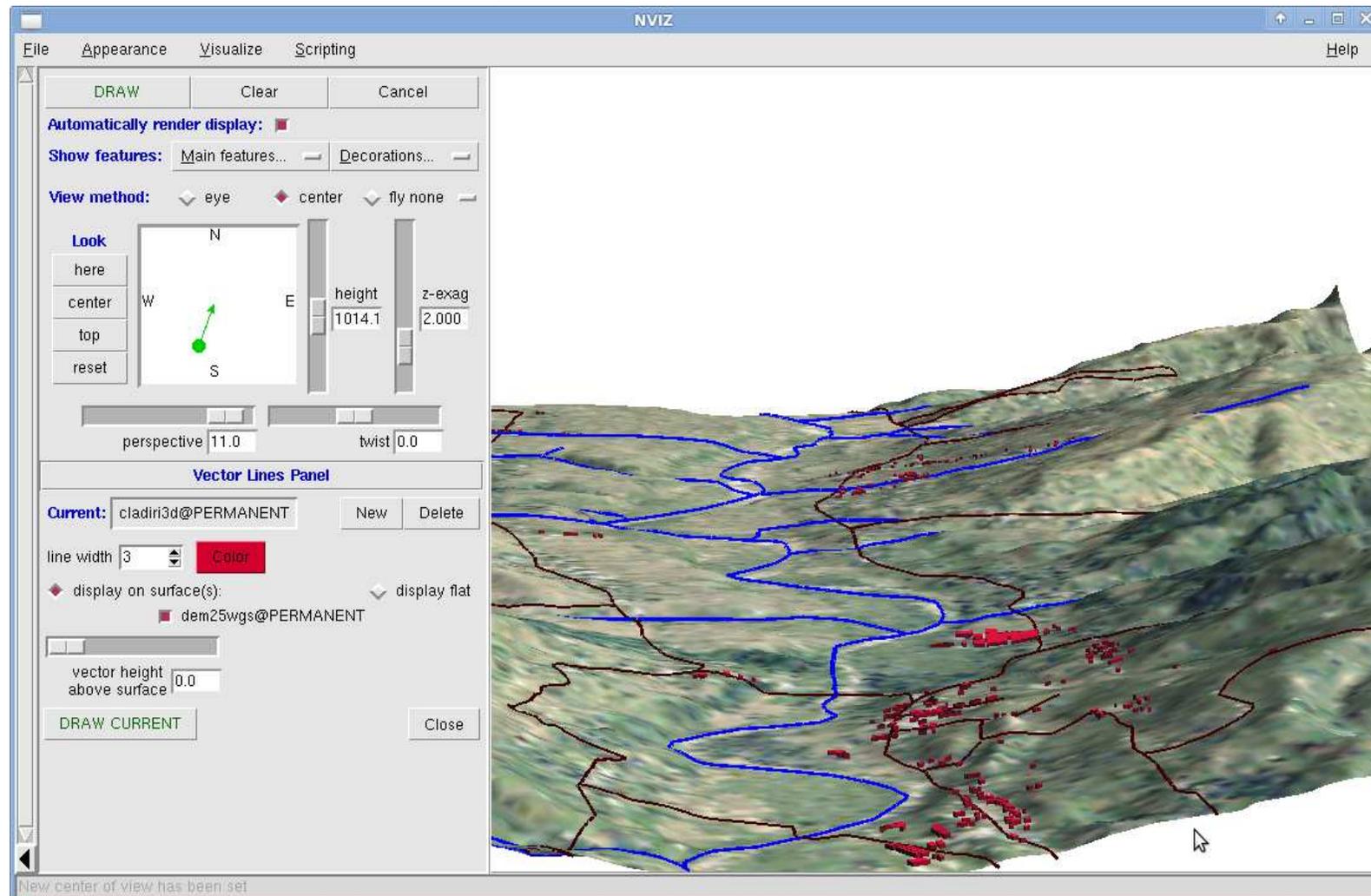
Rulam comanda



Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Fereastra NVIZ are urmatorul aspect:



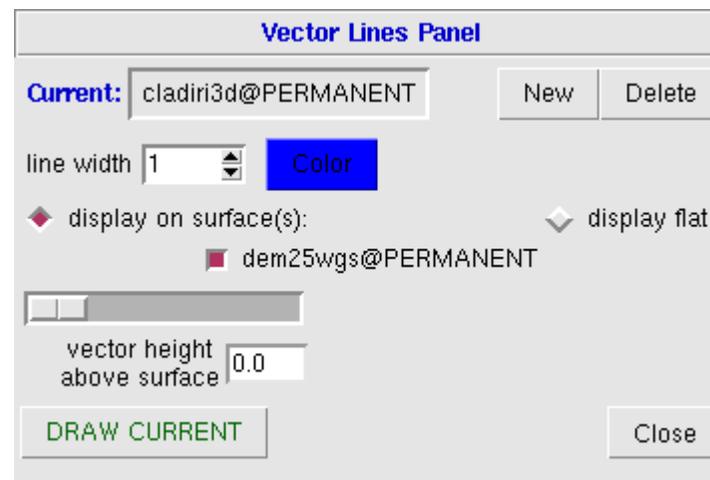


Manipularea datelor in GRASS

Explorarea 3D a realitatii geografice

Modificarea proprietatilor cladirilor se face cu optiunea Vector Lines Panel:
Executam in fereastra NVIZ: Fisualize > Vector Line/3D Polygons

Line width: dimensiunea liniilor
Color: culoarea cladirilor



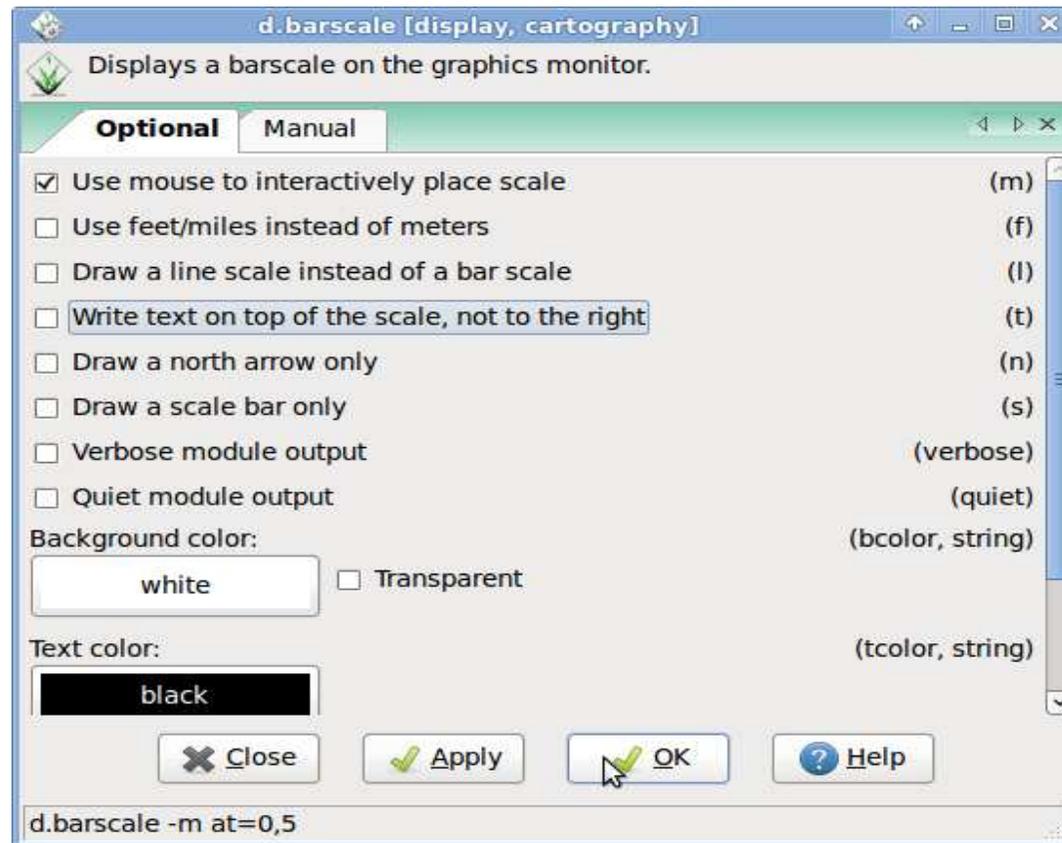
Manipularea datelor in GRASS

Pregătirea de imprimare/exportare

Pentru scara hartii

Executam in fereastra de vizualizare:

Add map elements > Add scale bar and north arrow



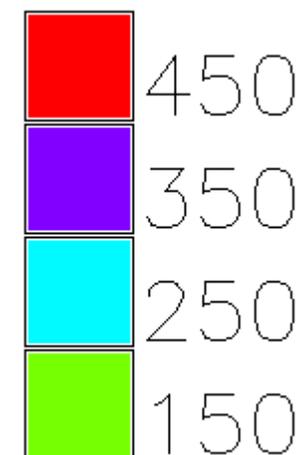
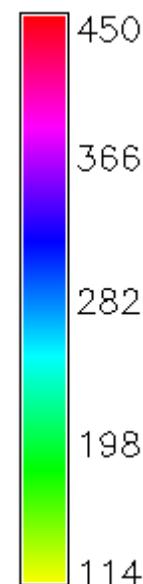
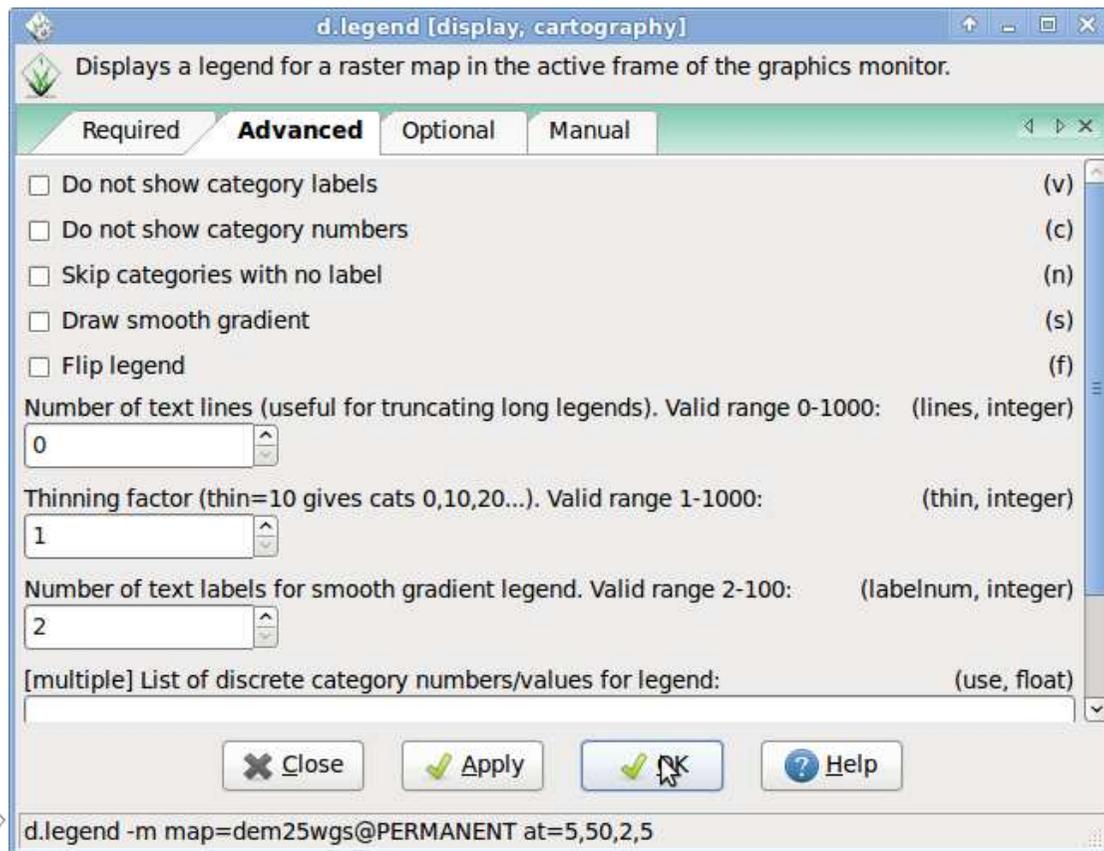
Manipularea datelor in GRASS

Pregătirea de imprimare/exportare

Pentru legenda

Executam in fereastra de vizualizare:

Add map elements > Add legend



Cu completare la
List of discrete
A valorilor:
450, 350, 250, 150

Cu completare la
List of discrete



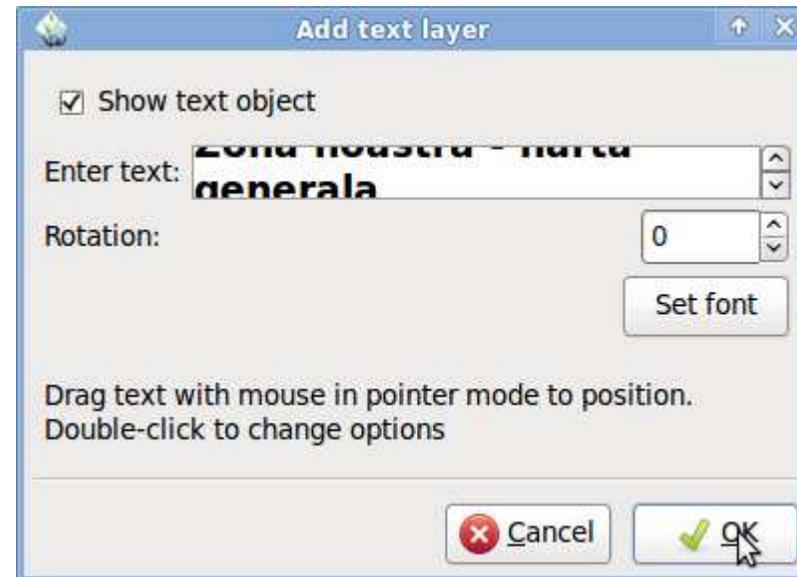
Manipularea datelor in GRASS

Pregătirea de imprimare/exportare

Pentru Titlu

Executam in fereastra de vizualizare:

Add map elements > Add text layer



Se seteaza si proprietatile fontului: Set font

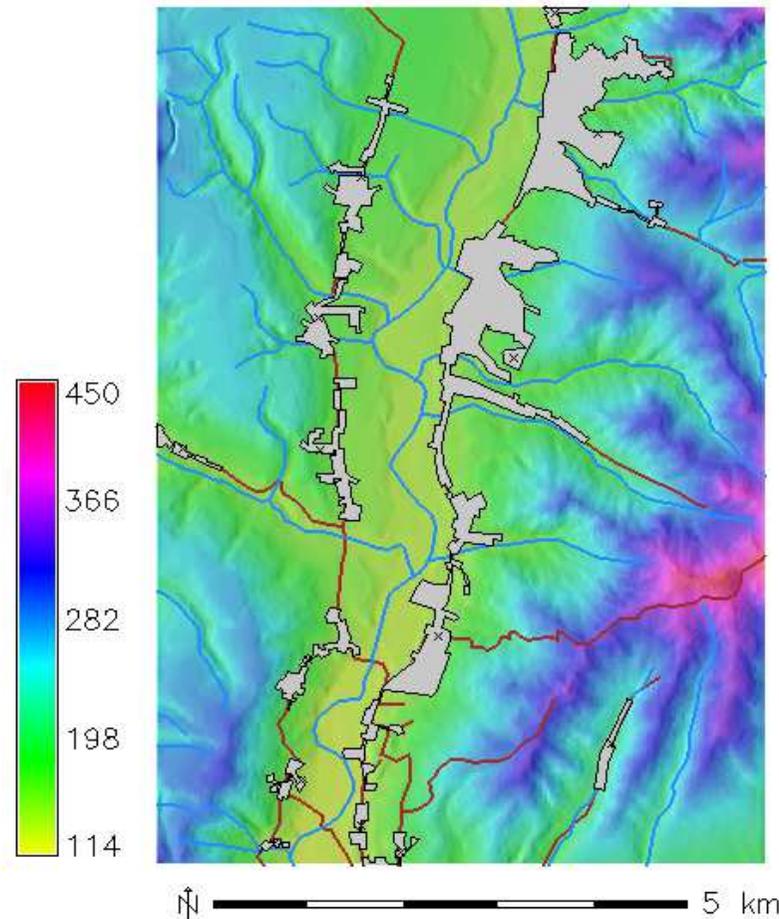


Manipularea datelor in GRASS

Pregătirea de imprimare/exportare

Rezultatul final pentru salvare imagine: Save display to graphic file

Zona noastră - harta generala



V A M U L T U M I M !

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<http://www.geo-spatial.org>
<http://www.freegis.ro>