Procesamiento de series de tiempo en GRASS GIS

Aplicaciones en Ecología y Ambiente

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CONICET - INMeT

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Exercise 2: Create a new Location and Mapset

Overview

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- Revise GRASS GIS database structure

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- Data fo the exercise

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- Data fo the exercise
- Create new locations and mapsets: different options

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- Reproject raster and vector maps

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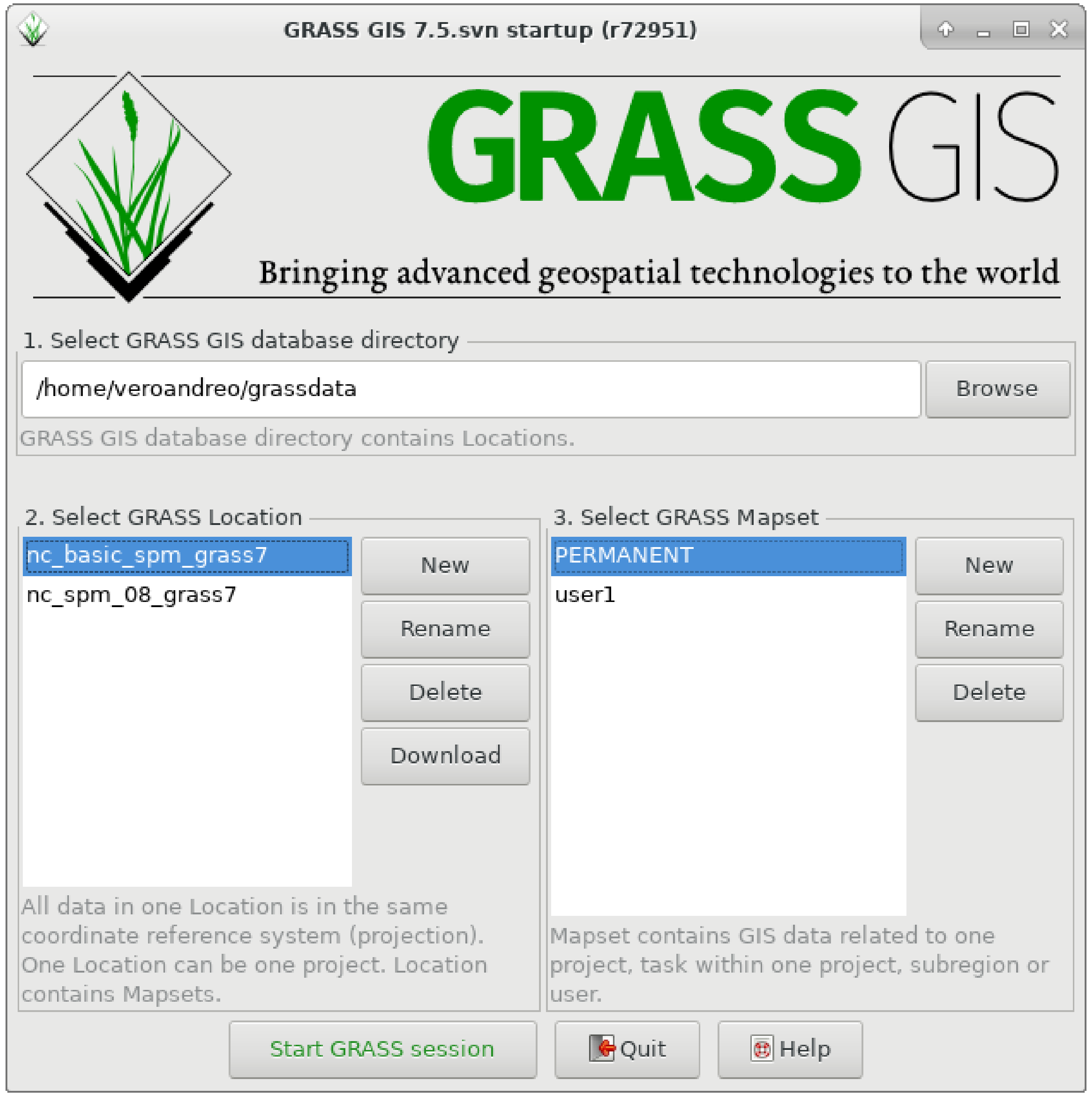
- Revise GRASS GIS database structure
- Data fo the exercise
- Create new locations and mapsets: different options
- Change mapsets / add mapsets to path
- Import raster and vector map
- Reproject raster and vector maps
- Export raster and vector maps

Data for this exercise

- Download the raster and vector sample files
- Create a folder in your `$HOME` directory (or Documents) and name it `gisdata`
- Unzip/Move the files within `$HOME/gisdata`



GRASS GIS 7.5.svn startup (r72951)

1. Select GRASS GIS database directory

/home/veroandreo/grassdata

GRASS GIS database directory contains Locations.

2. Select GRASS Location

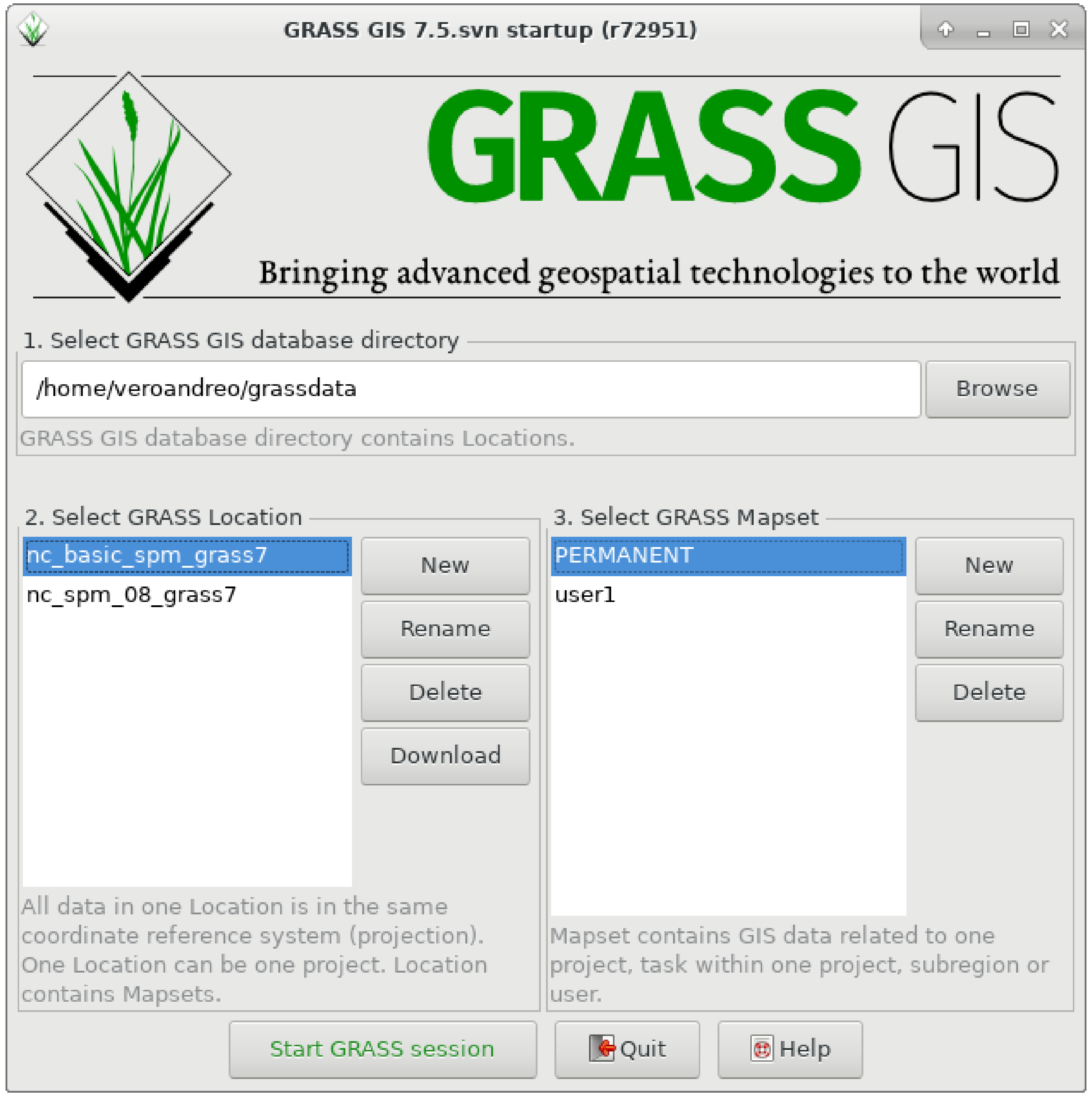
nc_basic_spm_grass7
nc_spm_08_grass7

All data in one Location is in the same coordinate reference system (projection). One Location can be one project. Location contains Mapsets.

3. Select GRASS Mapset

PERMANENT
user1

Mapset contains GIS data related to one project, task within one project, subregion or user.



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Bringing advanced geospatial technologies to the world

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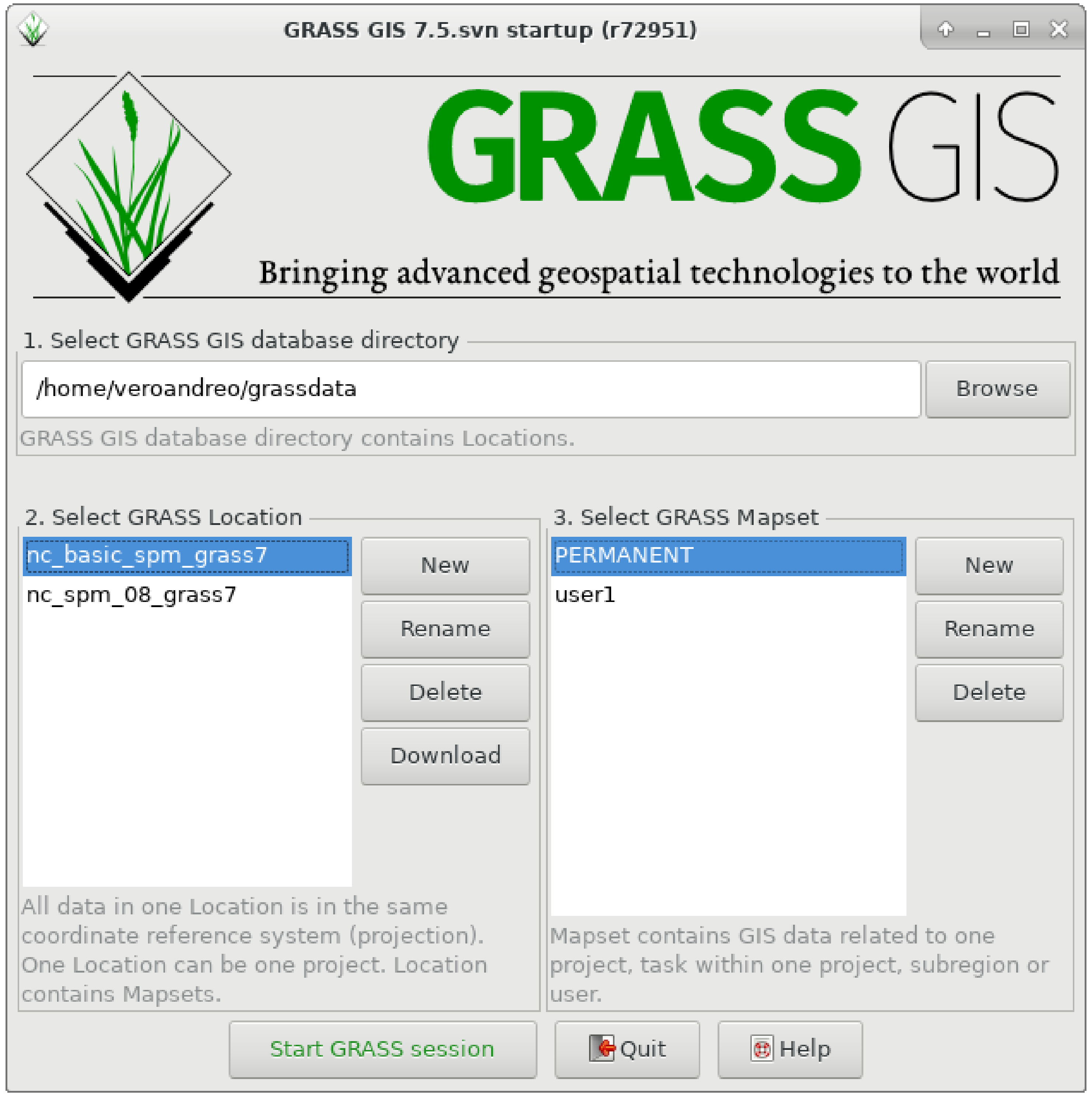

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user1

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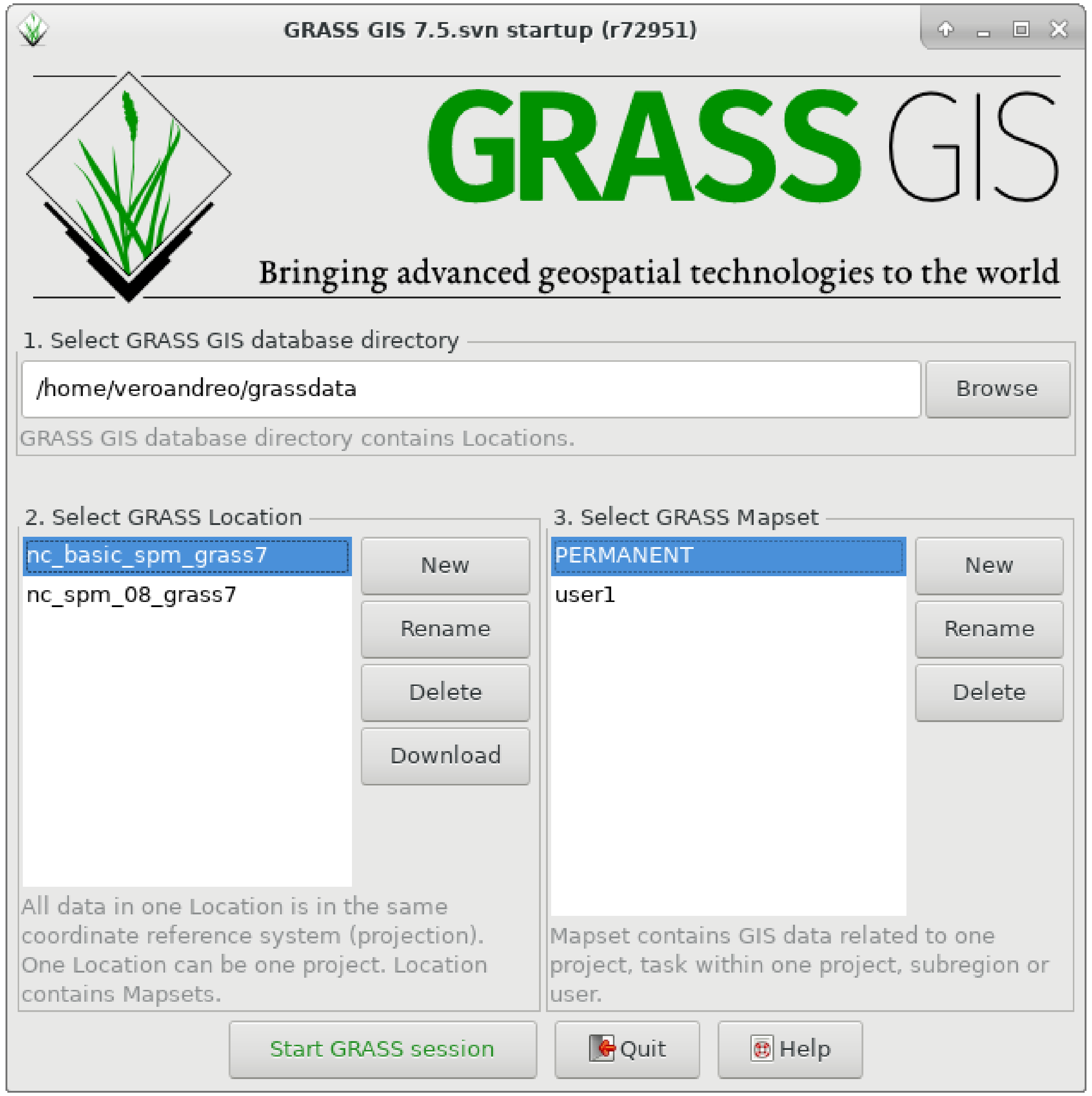
- Select the GRASS database folder
- Select the `nc_spm_08_grass7` location



GRASS GIS 7.5.svn startup (r72951)

GRASS GIS

Bringing advanced geospatial technologies to the world

1. Select GRASS GIS database directory

/home/veroandreo/grassdata

Browse

GRASS GIS database directory contains Locations.

2. Select GRASS Location

nc_basic_spm_grass7

nc_spm_08_grass7

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3. Select GRASS Mapset

PERMANENT

user1

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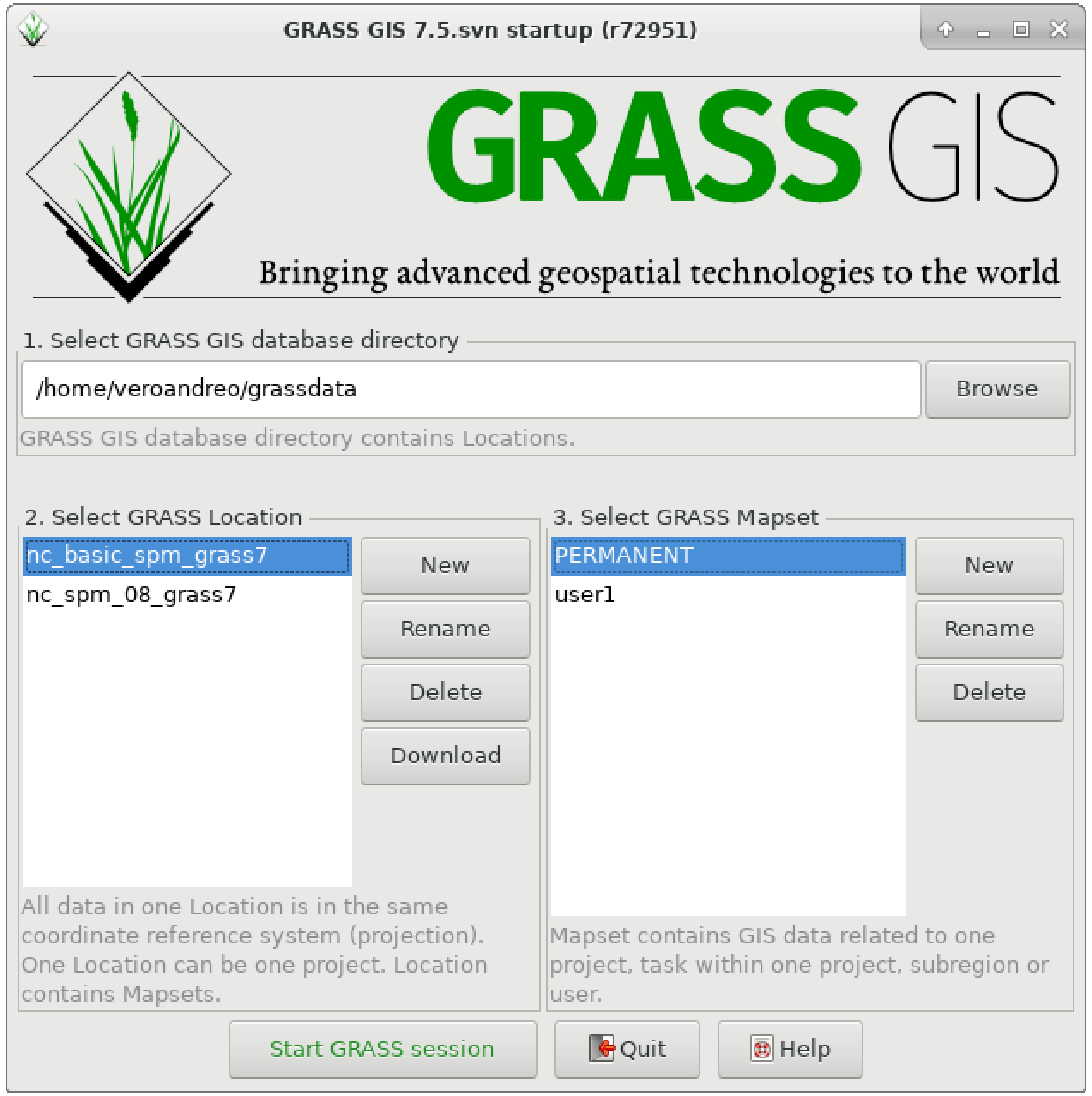
- Select the GRASS database folder
- Select the `nc_spm_08_grass7` location
- Select `user1` mapset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2. Select GRASS Location

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3. Select GRASS Mapset

PERMANENT
user1

Mapset contains GIS data related to one project, task within one project, subregion or user.

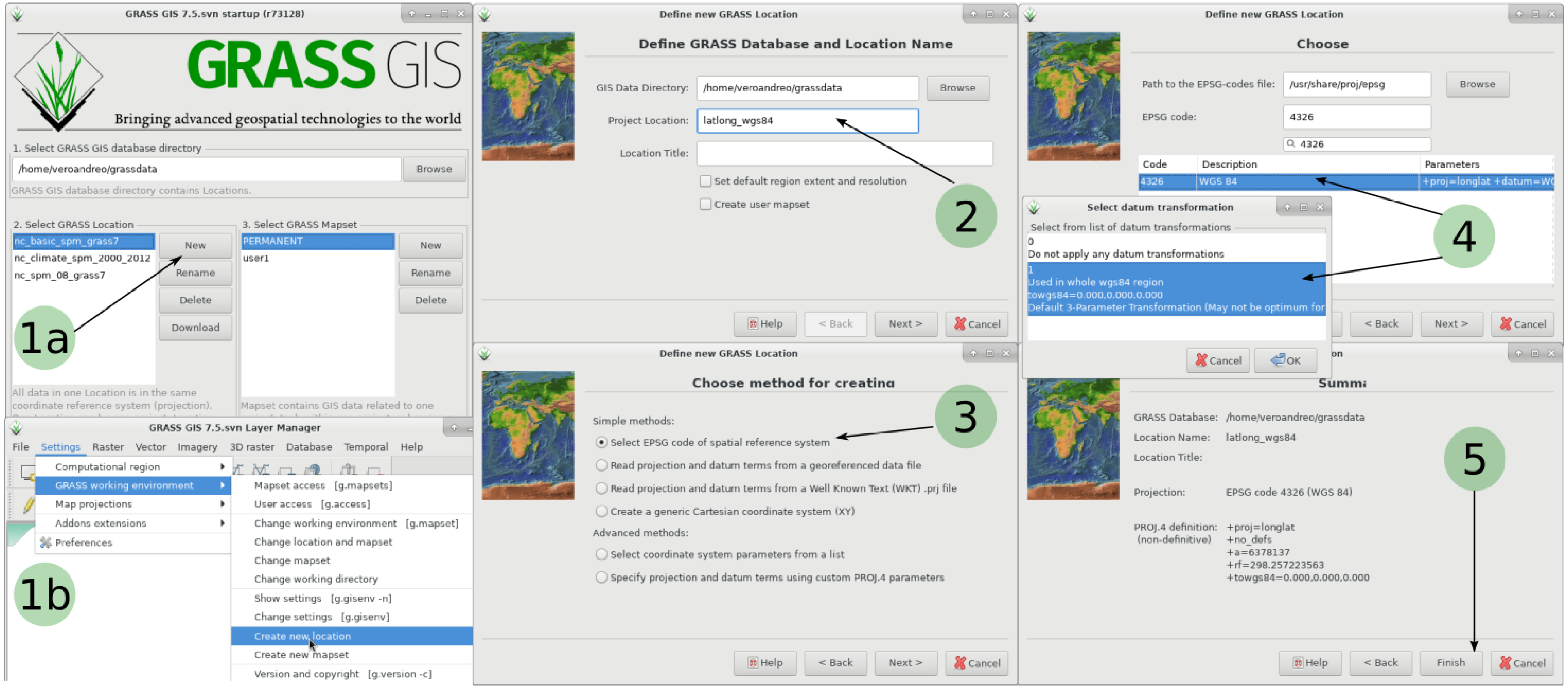
- Select the GRASS database folder
- Select the `nc_spm_08_grass7` location
- Select `user1` mapset
- Hit `Start GRASS session`

Creating a new Location

- From the GUI
  - button "New" in the Location wizard
  - from within a GRASS session: Settings → GRASS working environment → Create new location

- From the command line
  - using –c flag in the *grass74* start script
  - provide path to new location plus either a georeferenced map or an EPSG code

Creating a new Location from the GUI


1a
1b
2
3
4
5
GRASS GIS 7.5.svn startup (r73128)
GRASS GIS
Bringing advanced geospatial technologies to the world
Browse
New
Rename
Delete
Download
GRASS GIS 7.5.svn Layer Manager
File
Settings
Raster
Vector
Imagery
3D raster
Database
Temporal
Help
Computational region
GRASS working environment
Map projections
Addons extensions
Preferences
Mapset access [g.mapsets]
User access [g.access]
Change working environment [g.mapset]
Change location and mapset
Change mapset
Change working directory
Show settings [g.gisenv -n]
Change settings [g.gisenv]
Create new location
Create new mapset
Version and copyright [g.version -c]
Define new GRASS Location
Help
< Back
Next >
Cancel
Finish
OK

1. Select GRASS GIS database directory: /home/veroandreo/grassdata

GRASS GIS database directory contains Locations.

2. Select GRASS Location:
- nc_basic_spm_grass7
- nc_climate_spm_2000_2012
- nc_spm_08_grass7

3. Select GRASS Mapset:
- PERMANENT
- user1

All data in one Location is in the same coordinate reference system (projection).

Mapset contains GIS data related to one

Define GRASS Database and Location Name

GIS Data Directory: /home/veroandreo/grassdata

Project Location: latlong_wgs84

Location Title:

□ Set default region extent and resolution

□ Create user mapset

Choose method for creating

Simple methods:

● Select EPSG code of spatial reference system

○ Read projection and datum terms from a georeferenced data file

○ Read projection and datum terms from a Well Known Text (WKT) .prj file

○ Create a generic Cartesian coordinate system (XY)

Advanced methods:

○ Select coordinate system parameters from a list

○ Specify projection and datum terms using custom PROJ.4 parameters

Choose

Path to the EPSG-codes file: /usr/share/proj/epsg

EPSG code: 4326

4326

Code	Description	Parameters
4326	WGS 84	+proj=longlat +datum=W(

Select datum transformation

Select from list of datum transformations

0
Do not apply any datum transformations

1
Used in whole wgs84 region
towgs84=0.000,0.000,0.000
Default 3-Parameter Transformation (May not be optimum for

Summ

GRASS Database: /home/veroandreo/grassdata

Location Name: latlong_wgs84

Location Title:

Projection: EPSG code 4326 (WGS 84)

PROJ.4 definition: (non-definitive)
+proj=longlat
+no_defs
+a=6378137
+rf=298.257223563
+towgs84=0.000,0.000,0.000

Create new Lat-Long location using EPSG code

Creating new location from command line

```
# Creates new location with EPSG code 4326
grass74 -c EPSG:4326 $HOME/grassdata/mylocation

# Creates new location based on georeferenced Shapefile
grass74 -c myvector.shp $HOME/grassdata/mylocation

# Creates new location based on georeferenced GeoTIFF file
grass74 -c myraster.tif $HOME/grassdata/mylocation
```

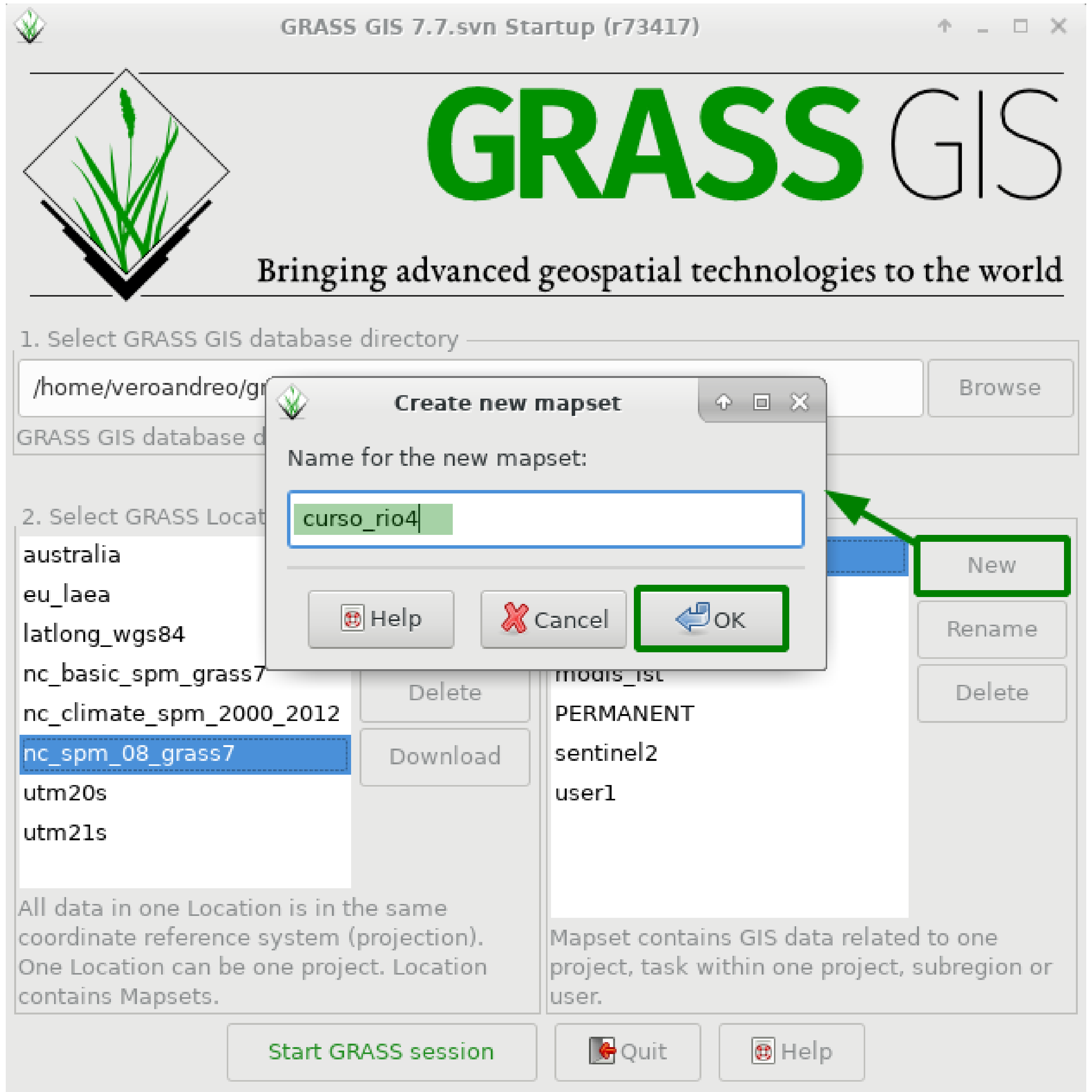
This can also be done from a different location; GRASS will switch to the newly created one.

Creating a new mapset

- From the GUI
  - button "New" in the Mapset wizard
  - from within a GRASS session: Settings → GRASS working environment → Create new mapset
- From command line
  - using –c flag in the *grass74* script, just add the mapset name to the path
  - with g.mapset command from within a GRASS session

Creating a new mapset from the GUI

using *New* button in wizard



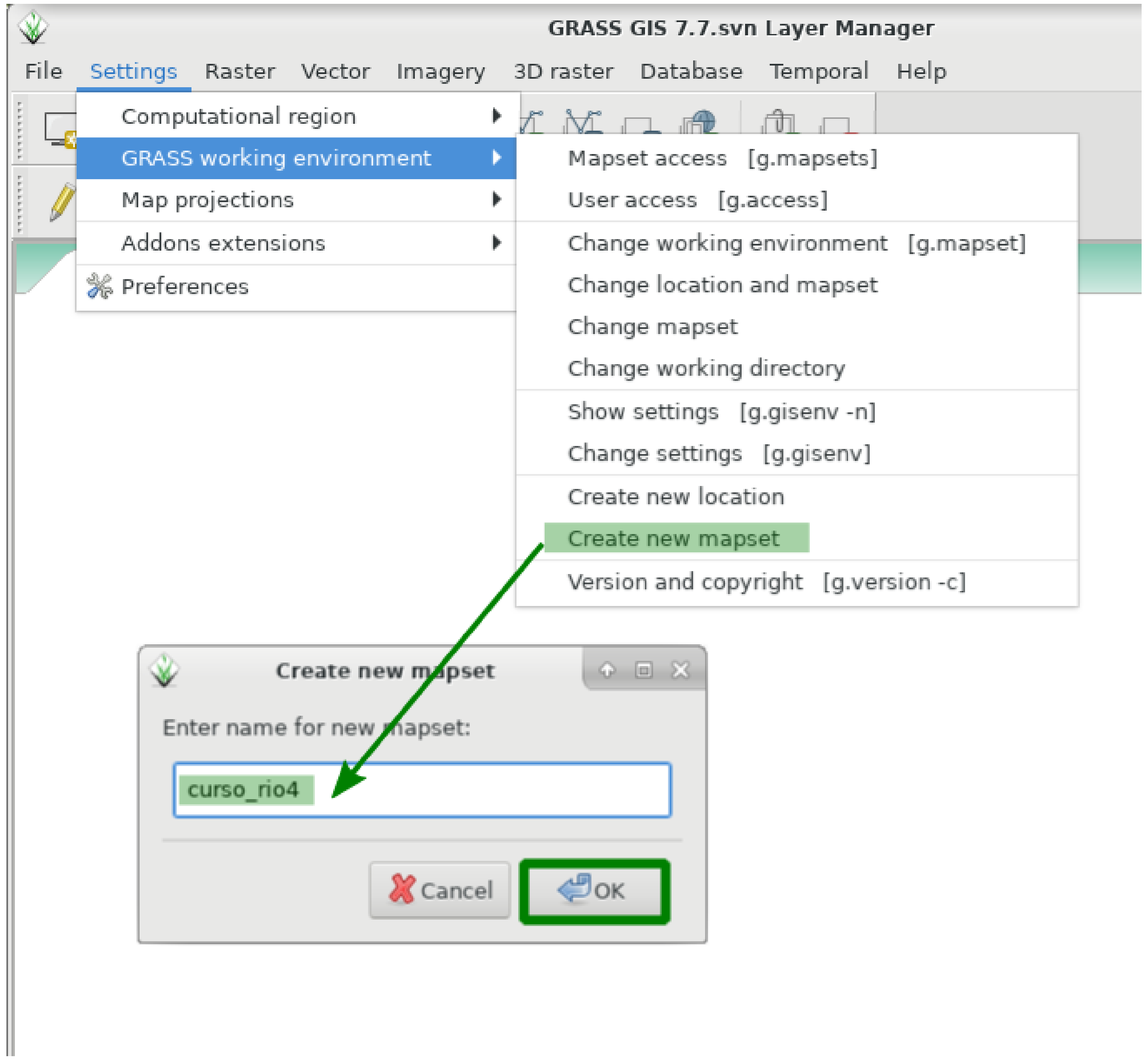
/home/veroandreo/gr

Name for the new mapset: curso_rio4

All data in one Location is in the same coordinate reference system (projection). One Location can be one project. Location contains Mapsets.

Mapset contains GIS data related to one project, task within one project, subregion or user.

from within a GRASS session



Enter name for new mapset: curso_rio4

Creating a new mapset from command line

- Start GRASS and create location and mapset all at once

```
# Creates new location and mapset
grass74 -c EPSG:4326 $HOME/grassdata/mylocation/mymapset
```

- Create a mapset from within a running GRASS session:

```
# Create a new mapset within a GRASS session
g.mapset -c mapset=curso_rio4
```

Remove Locations or Mapsets

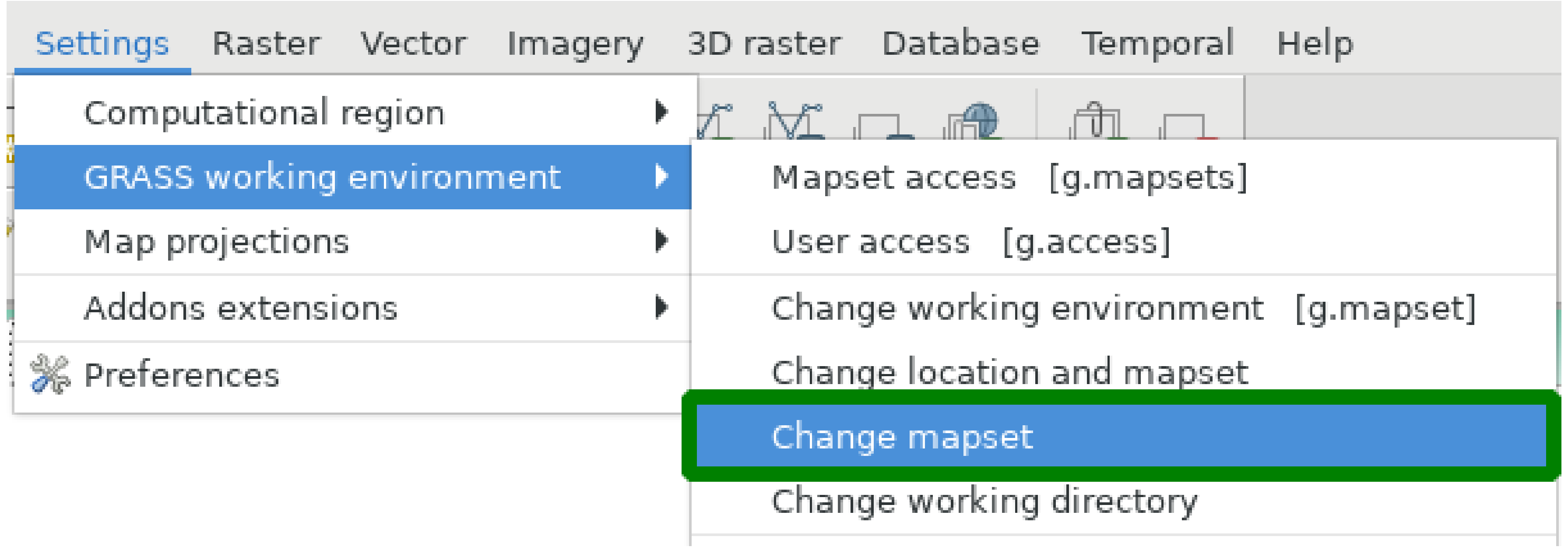
Just remove the folder or use the Location wizard

Rename Locations and Mapsets

From the Location wizard

Change to a different mapset

- From the GUI:



- From command line:

```
# print current mapset
g.mapset -p
# list available mapsets
g.mapsets -l
# change to user1 mapset
g.mapset mapset=user1
```

Add mapsets to path

Sometimes we need to *read data from a different mapset* and use it for a certain processing, so we need to *see* that mapset from the current one

```
# print accessible mapsets
g.mapsets -p
# add user1 to the accessible mapsets
g.mapsets mapset=user1 operation=add
# check it was added
g.mapsets -p
# check current mapset
g.mapset -p
```

Tasks:

- *Create a new location with EPSG:4326 and name it latlong*
- *Create a new mapset called curso_rio4 within the latlong location*

Choose whatever method you prefer

Hint: from command line is only one line 😉...

Import raster and vector maps

- r.in.gdal: Imports raster data into a GRASS raster map using GDAL library.

```
r.in.gdal input=myraster.tif output=myraster
```

- v.in.ogr: Imports vector data into a GRASS vector map using OGR library.

```
v.in.ogr input=myvector.shp output=myvector
```

CRS of maps must match that of the Location

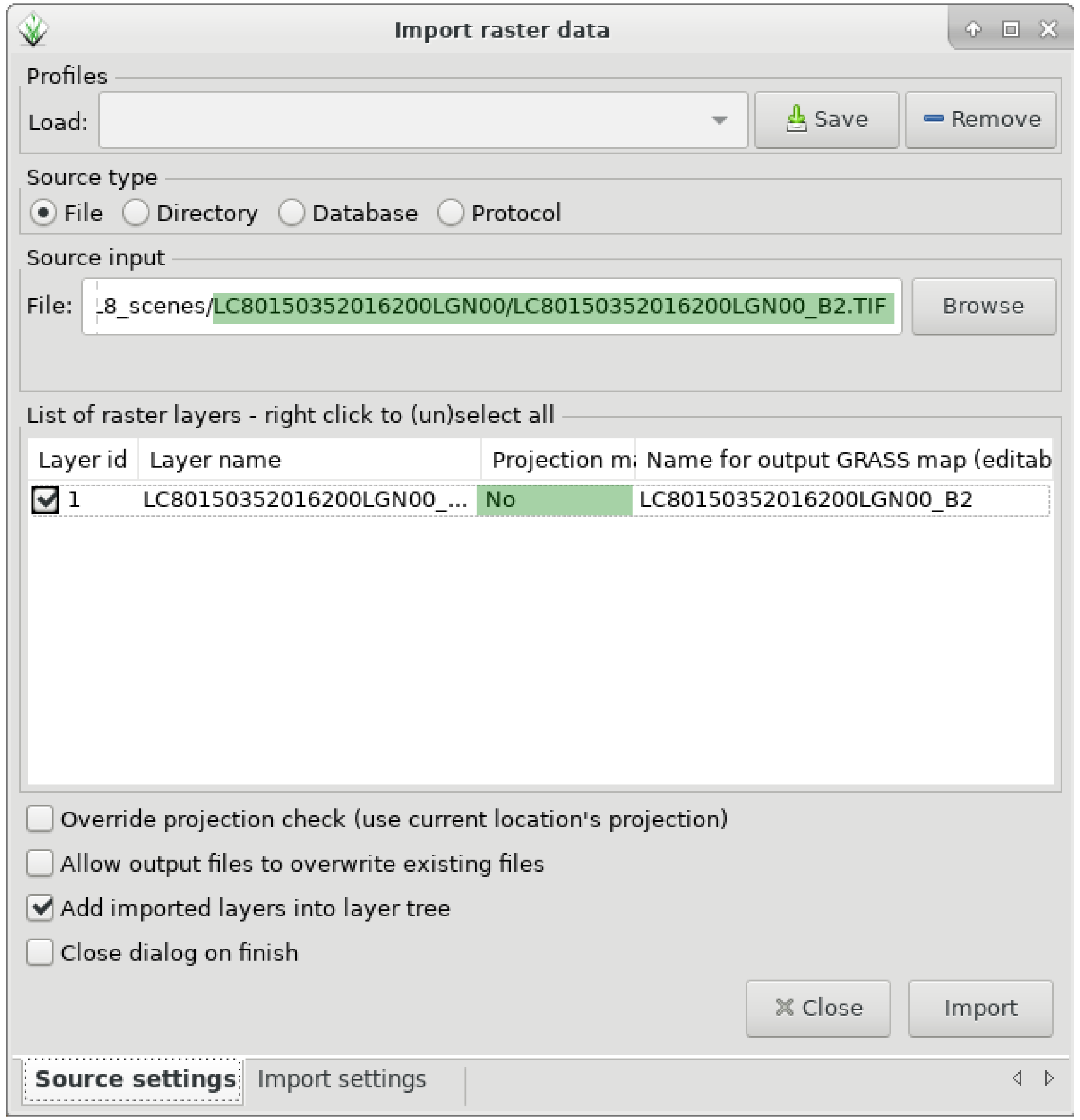
Import raster and vector maps

Alternatively, we can use:

- r.import
- v.import

that offer also re-projection, resampling and subset on the fly ☺

Import a raster map



Import raster data

Profiles

Load: | Save | Remove

Source type

● File ○ Directory ○ Database ○ Protocol

Source input

File: .8_scenes/LC80150352016200LGN00/LC80150352016200LGN00_B2.TIF | Browse

List of raster layers - right click to (un)select all

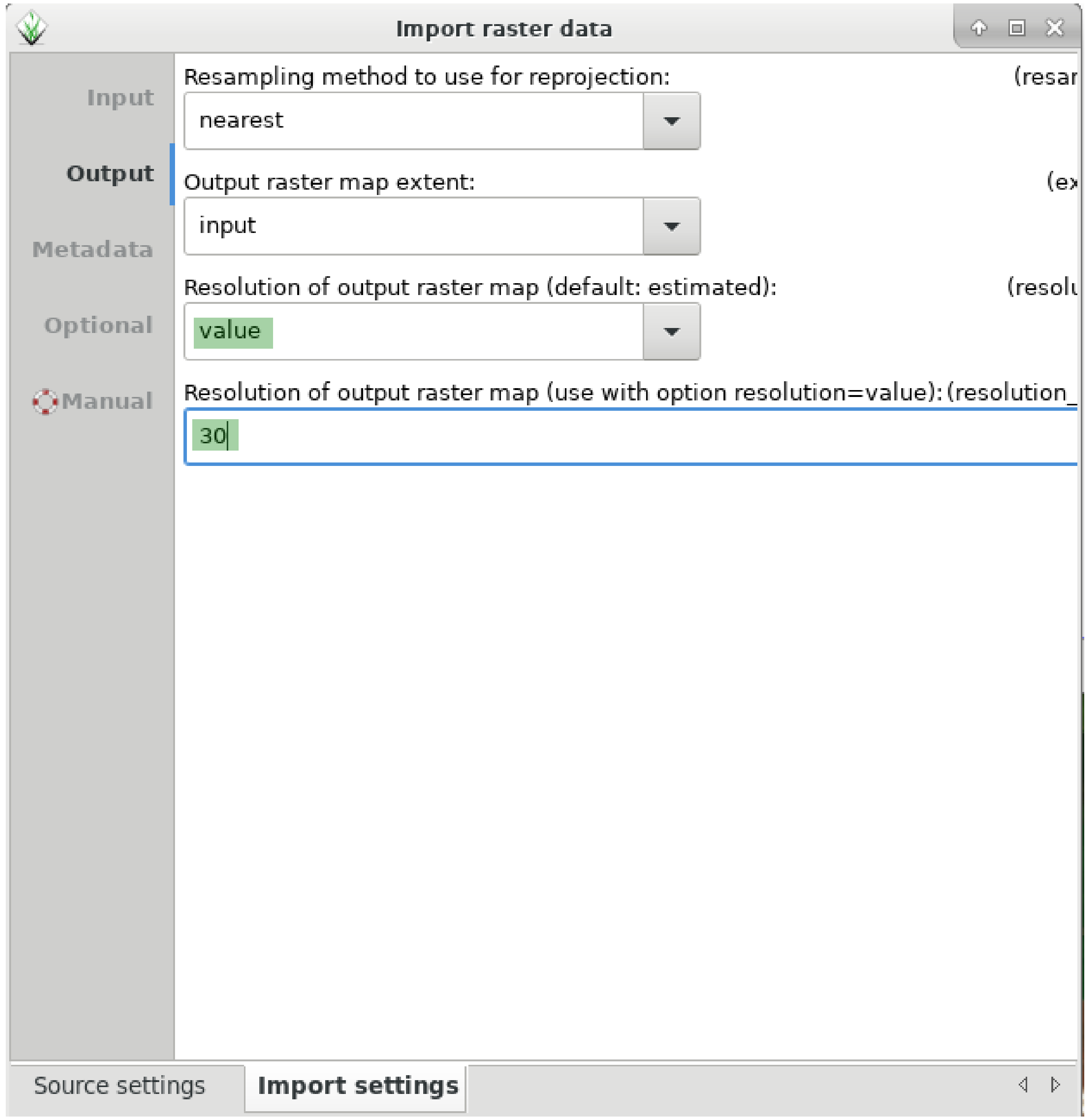
Layer id	Layer name	Projection m:	Name for output GRASS map (editab
☑ 1	LC80150352016200LGN00_...	No	LC80150352016200LGN00_B2

□ Override projection check (use current location's projection)

□ Allow output files to overwrite existing files

☑ Add imported layers into layer tree

□ Close dialog on finish



Import raster data

Resampling method to use for reprojection: (resar

nearest

Output raster map extent: (ex

input

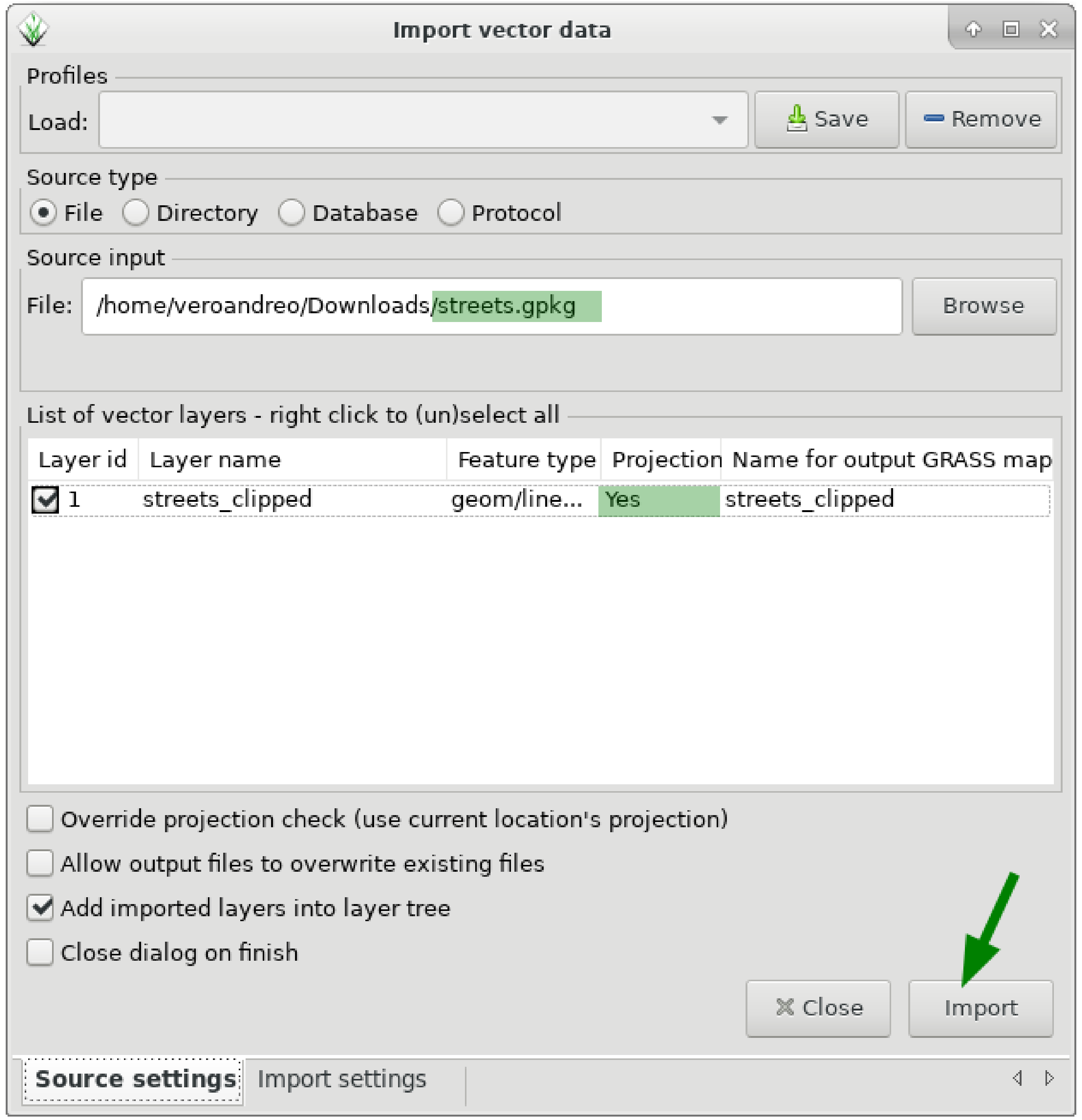
Resolution of output raster map (default: estimated): (resolu

value

Resolution of output raster map (use with option resolution=value): (resolution_

30

Import a vector map



Import vector data

Profiles

Load: [ ] Save Remove

Source type

● File ○ Directory ○ Database ○ Protocol

Source input

File: /home/veroandreo/Downloads/streets.gpkg Browse

List of vector layers - right click to (un)select all

Layer id	Layer name	Feature type	Projection	Name for output GRASS map
☑ 1	streets_clipped	geom/line...	Yes	streets_clipped

☐ Override projection check (use current location's projection)

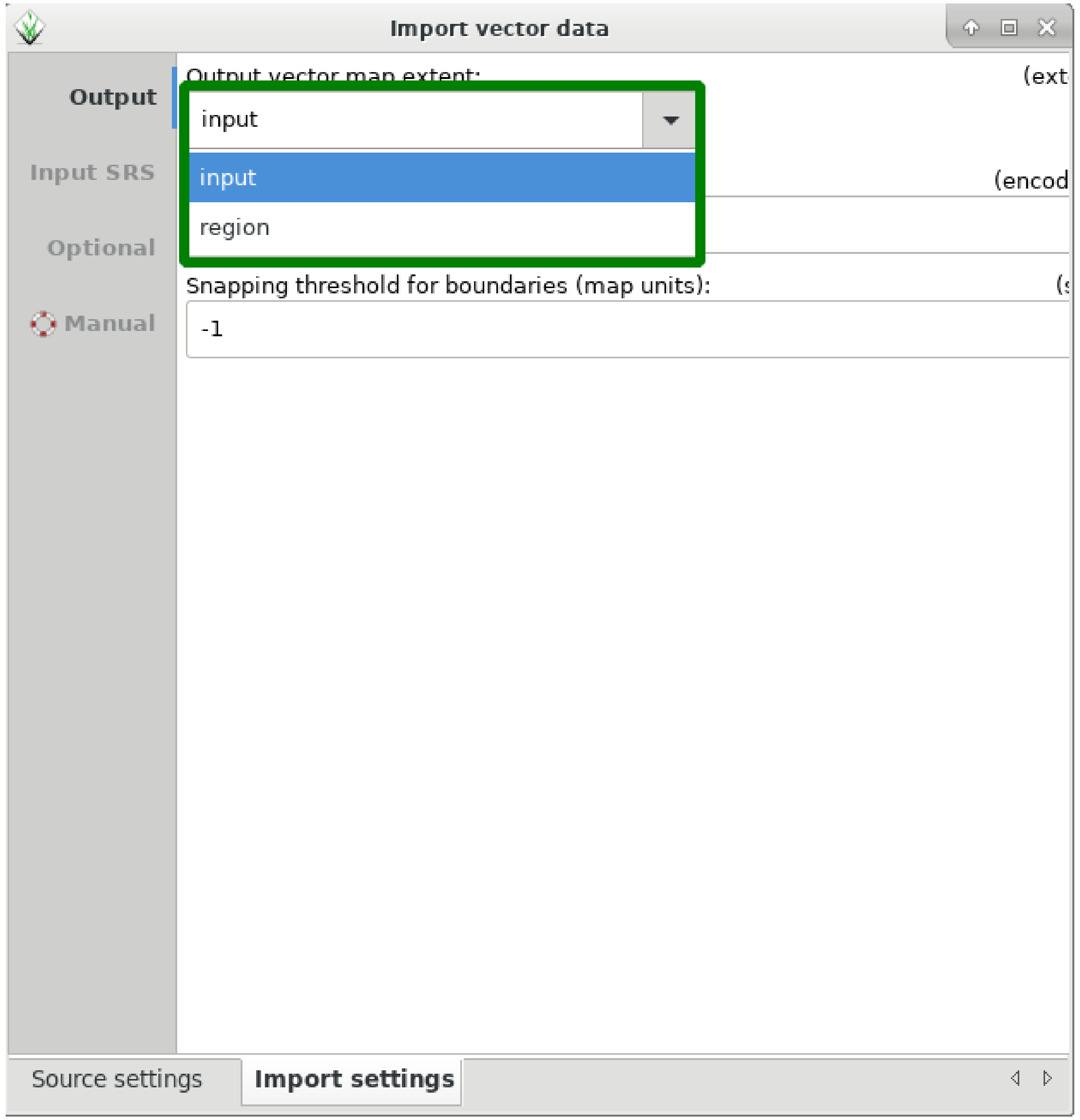
☐ Allow output files to overwrite existing files

☑ Add imported layers into layer tree

☐ Close dialog on finish

Close Import

Source settings Import settings



Import vector data

Output

Input SRS

Optional

Manual

Output vector map extent: (ext

input

input

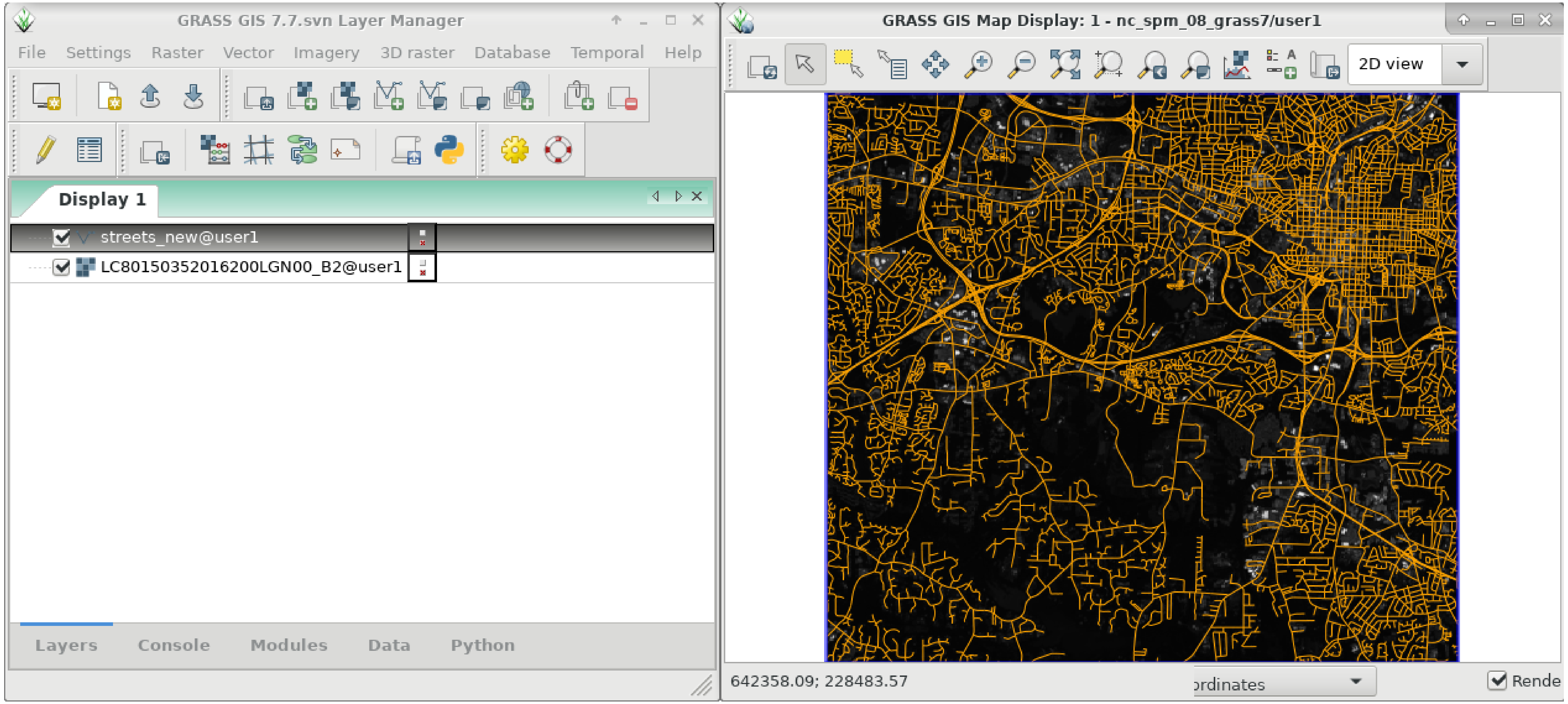
region

(encod

Snapping threshold for boundaries (map units): (s

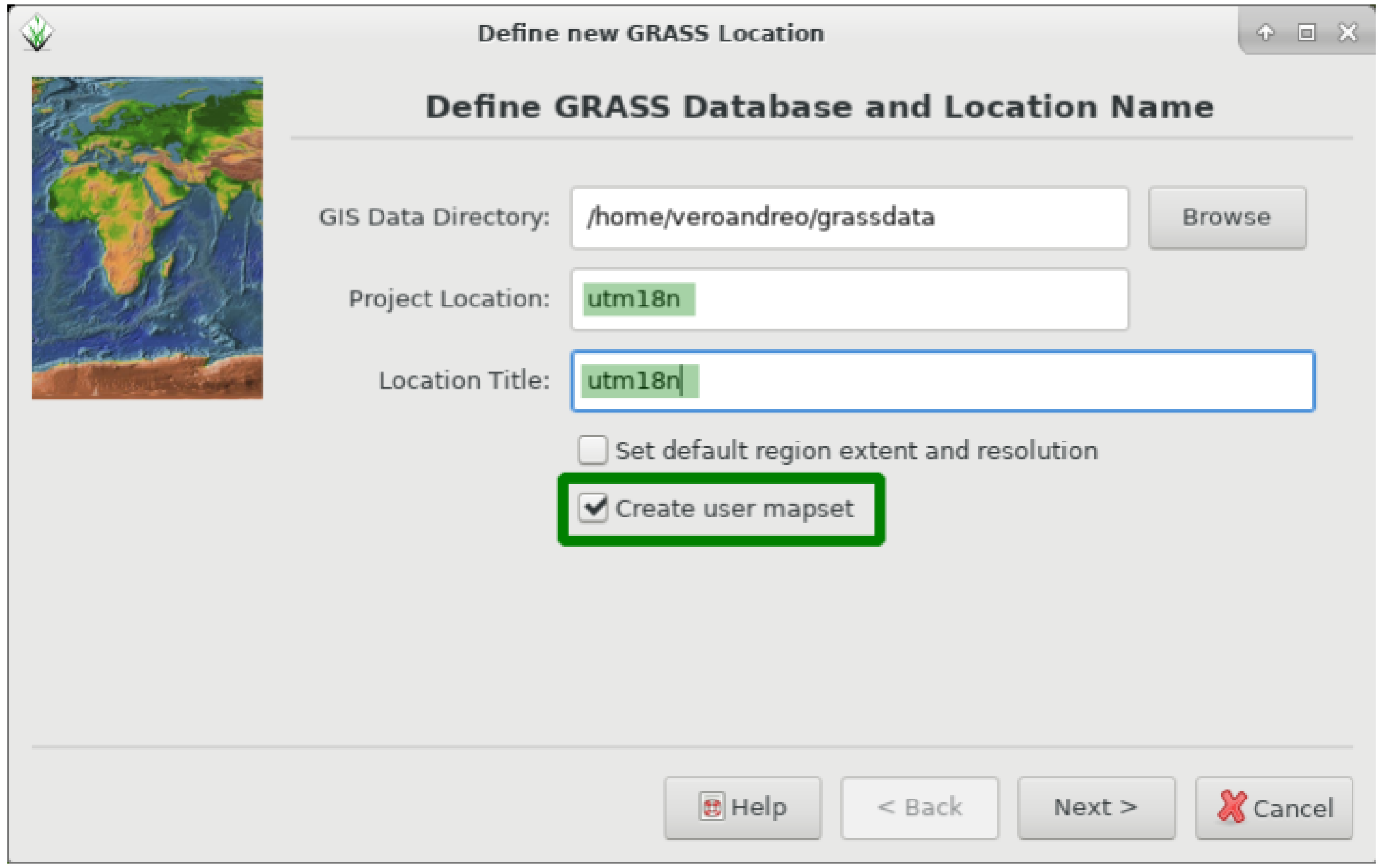
-1

Source settings Import settings



Imported maps are displayed by default

Create location and mapset from georeferenced file



Define new GRASS Location

Define GRASS Database and Location Name

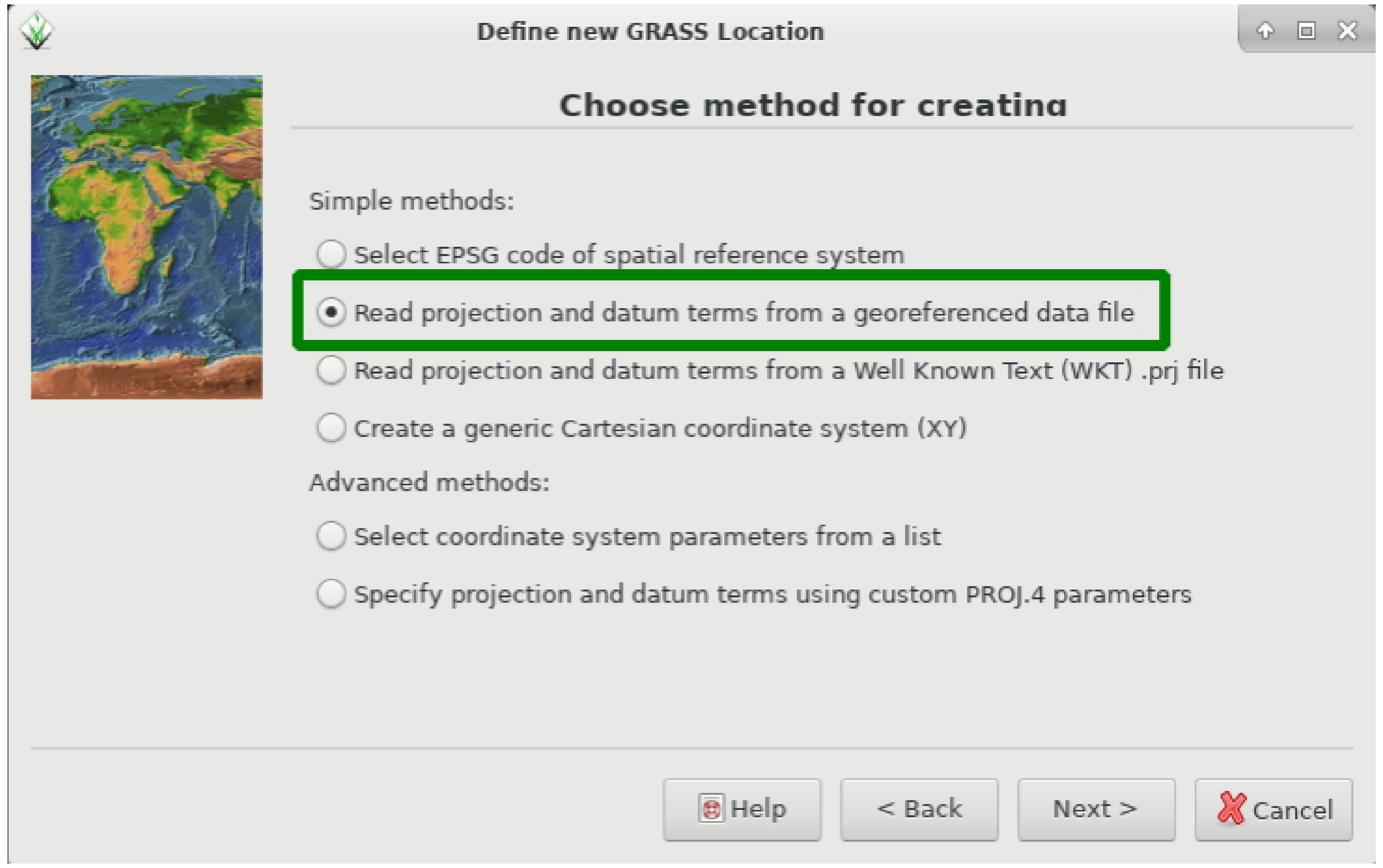
GIS Data Directory: /home/veroandreo/grassdata

Project Location: utm18n

Location Title: utm18n

□ Set default region extent and resolution

☑ Create user mapset



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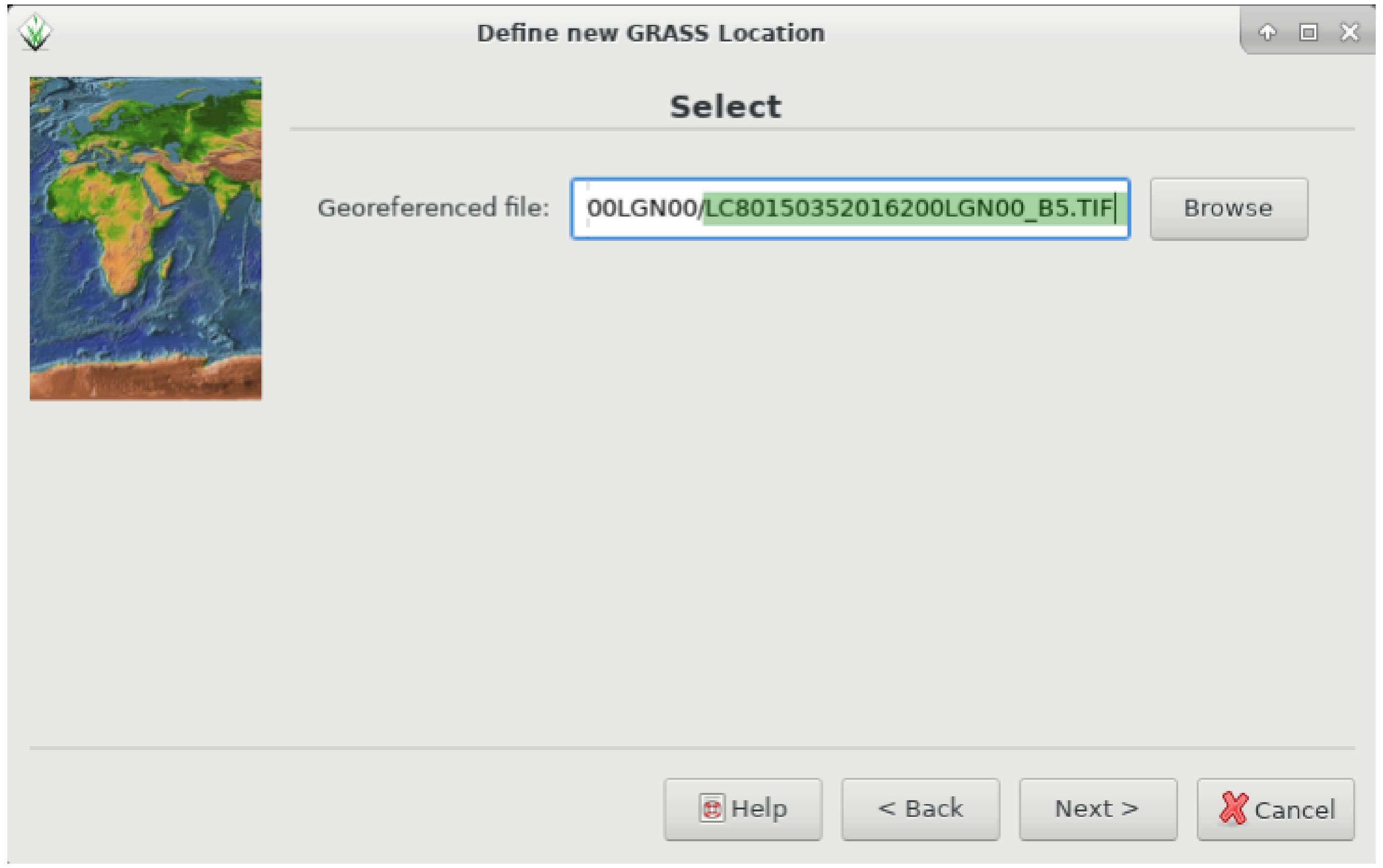
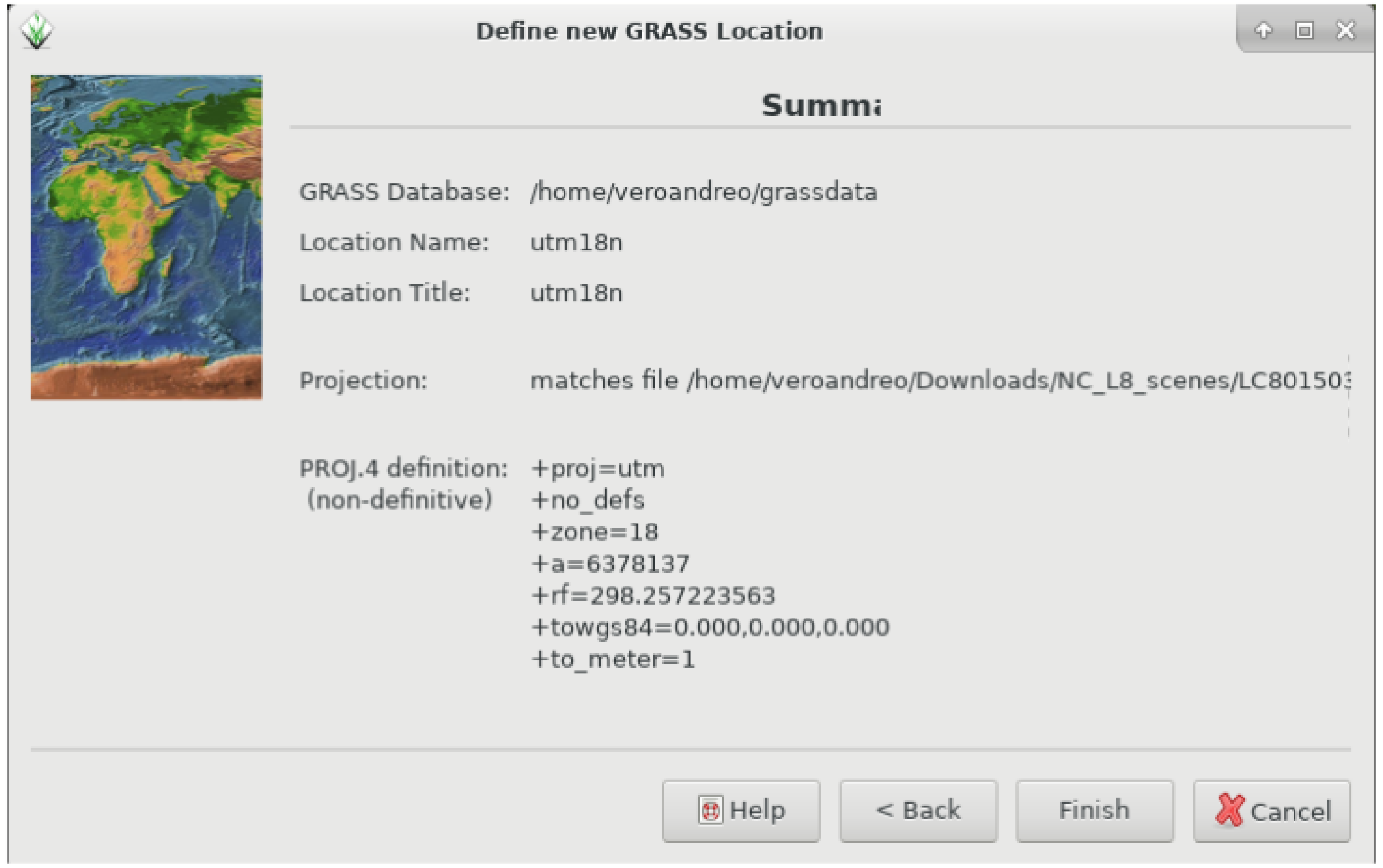


Define new GRASS Location

Select

Georeferenced file: 00LGN00/LC80150352016200LGN00_B5.TIF



Define new GRASS Location

Summ

GRASS Database: /home/veroandreo/grassdata

Location Name: utm18n

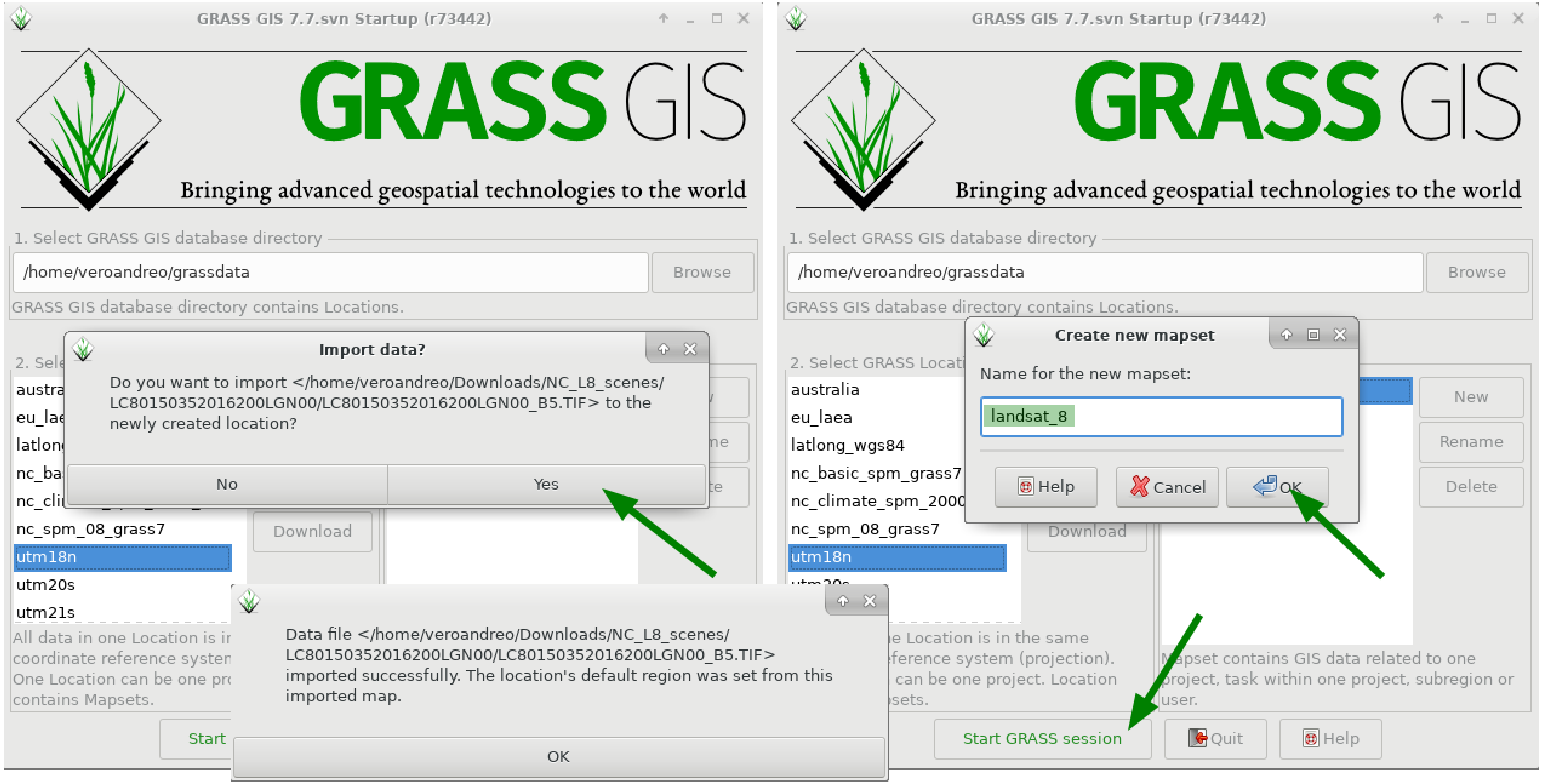
Location Title: utm18n

Projection: matches file /home/veroandreo/Downloads/NC_L8_scenes/LC80150

PROJ.4 definition: (non-definitive)

```
+proj=utm
+no_defs
+zone=18
+a=6378137
+rf=298.257223563
+towgs84=0.000,0.000,0.000
+to_meter=1
```

Create location and mapset from georeferenced file



GRASS GIS 7.7.svn Startup (r73442)

1. Select GRASS GIS database directory

/home/veroandreo/grassdata

GRASS GIS database directory contains Locations.

Import data?

Do you want to import </home/veroandreo/Downloads/NC_L8_scenes/LC80150352016200LGN00/LC80150352016200LGN00_B5.TIF> to the newly created location?

Data file </home/veroandreo/Downloads/NC_L8_scenes/LC80150352016200LGN00/LC80150352016200LGN00_B5.TIF> imported successfully. The location's default region was set from this imported map.

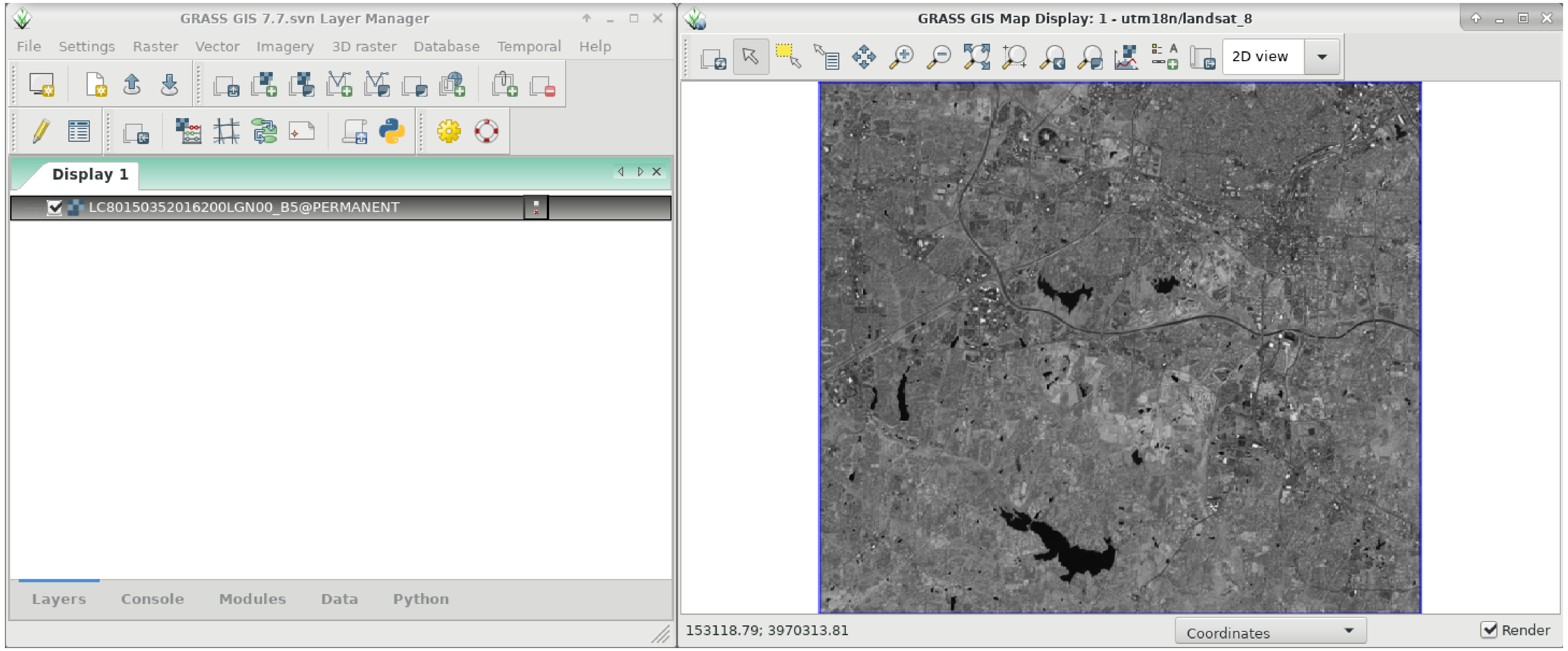
Create new mapset

Name for the new mapset: landsat_8

All data in one Location is in the same coordinate reference system (projection). One Location can be one project. Location contains Mapsets.

Mapset contains GIS data related to one project, task within one project, subregion or user.

Create location and mapset from georeferenced file


GRASS GIS 7.7.svn Layer Manager
File Settings Raster Vector Imagery 3D raster Database Temporal Help
Display 1
LC80150352016200LGN00_B5@PERMANENT
Layers Console Modules Data Python
GRASS GIS Map Display: 1 - utm18n/landsat_8
2D view
153118.79; 3970313.81
Coordinates
Render

How to get metadata from any raster map?

```
gdalinfo <mapname>
```

Set computational region

```
# check region
g.region -p
# set region to imported raster map
g.region raster=XX
```

Working without importing maps

We can also only **link** our geodata to the GRASS DB:

- r.external: Links GDAL supported raster data as a pseudo GRASS raster map.
- v.external: Creates a pseudo-vector map as a link to an OGR-supported layer or a PostGIS feature table.

Do not rename, delete or move the *linked* file afterwards... !

Maps reprojection

Locations are defined by CRS, so

to transfer maps between locations → *map re-projection*

Maps reprojection

- **Raster map re-projection:** The user needs to set desired extent and resolution prior to re-projection in target location
- **Vector map re-projection:** The whole vector map is re-projected by coordinate conversion

***Mechanism:** Working in target location, maps are projected into it from the source location*

Tasks:

- *Create a new location named UTM18N from the L8 band 5 file and then reproject (with r.proj) it to North Carolina location (mapset curso_rio4)*
- *Now, import (with reprojection on the fly) the L8 band 2 file into North Carolina location (mapset curso_rio4) and set the region to the imported raster map*

Export raster and vector maps

Task:

Explore r.out.gdal and v.out.ogr manual pages and export elevation and roadsmajor maps

Thanks for your attention!!

GRASS GIS

Move on to:

Raster data processing

Presentation powered by

GitPitch