



Make your own maps with free/open source Geographic Information Systems



ALEXANDRU IOAN CUZA UNIVERSITY of IAȘI

www.uaic.ro

Make Your Own Map!

Lecturer Mihai NICULIȚĂ
Department of Geography
Faculty of Geography and Geology

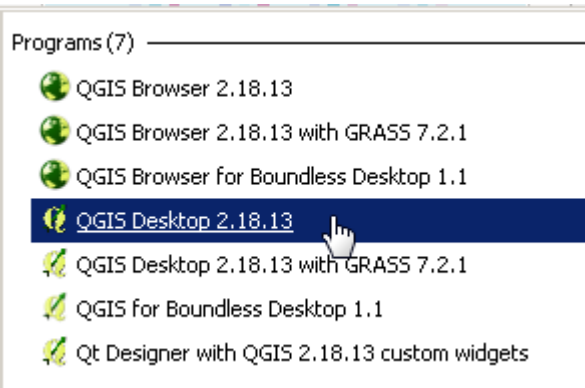


Map

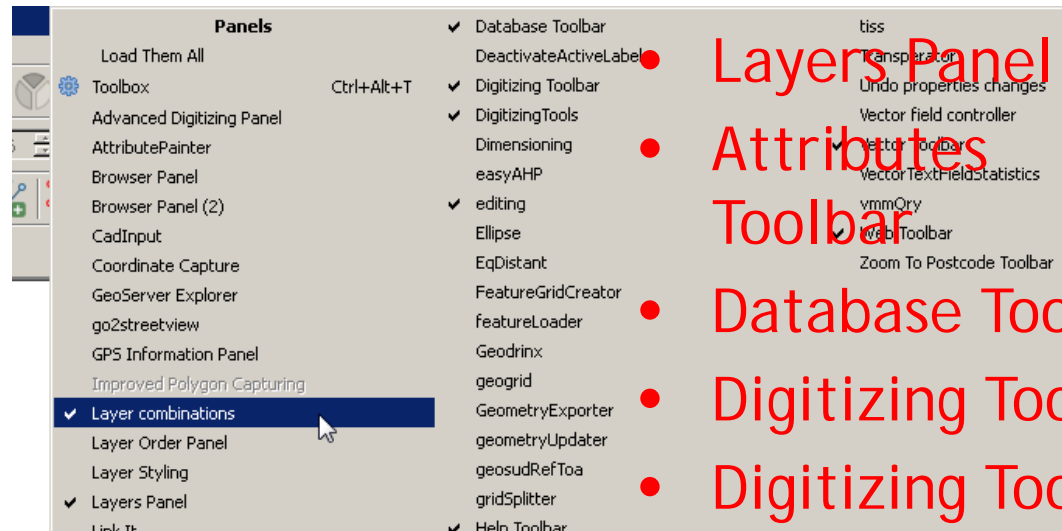
- From a cartographic perspective the map is a generalized and reduced (at scale) representation of the features of the Earth surface.
- Computers, Geographic Information Systems, open source libraries and remote sensing have revolutioned the domain.
- These days, anyone can create maps. The simple maps are **the mashups**.
- Any map should be viewed critically because has some features that are different from the reality, and can be used to distort the reality and for manipulating people perception.



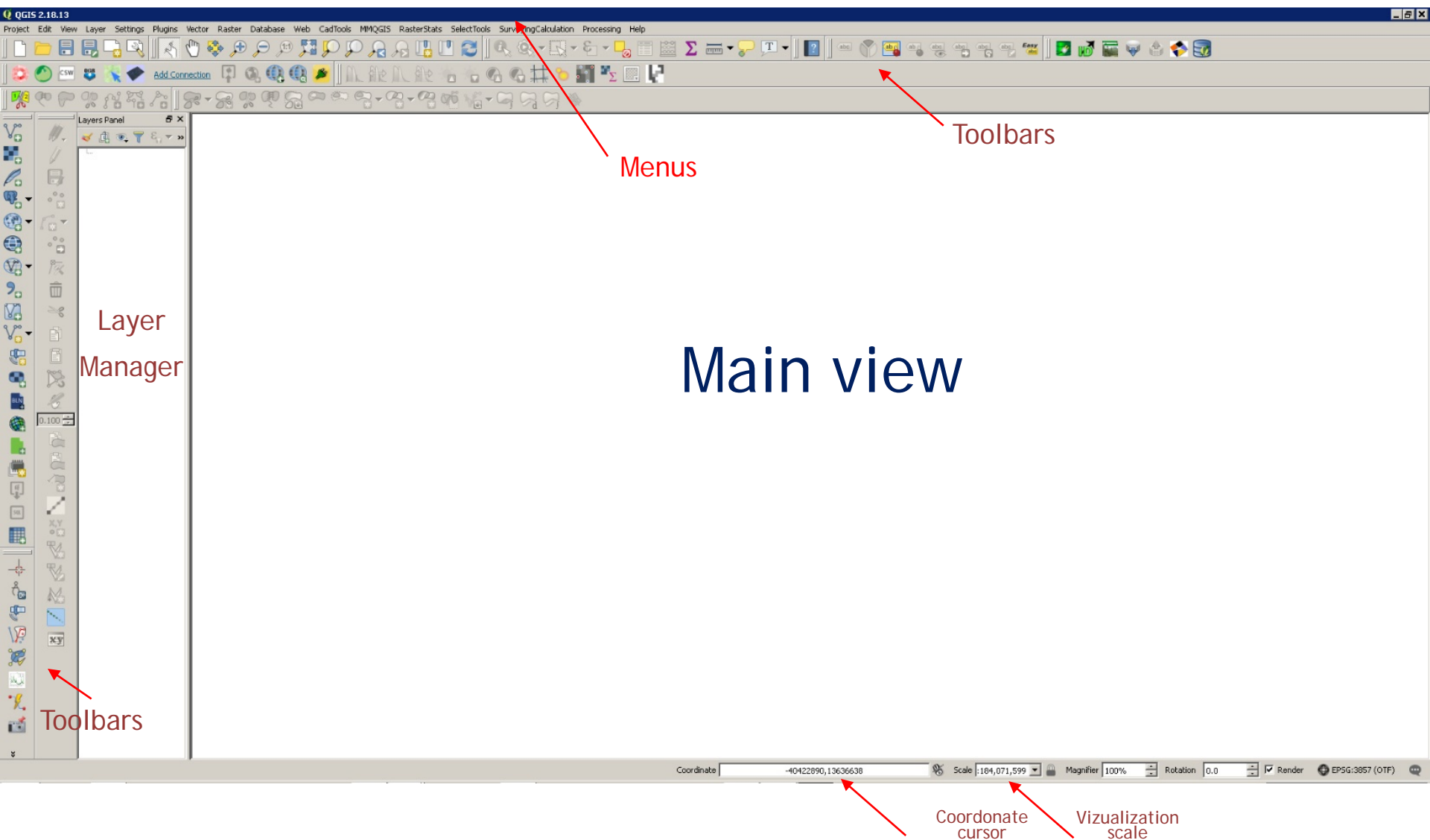
QGIS -open source GIS



- The following panels (right click on the upper grey area of QGIS window) should be activated:

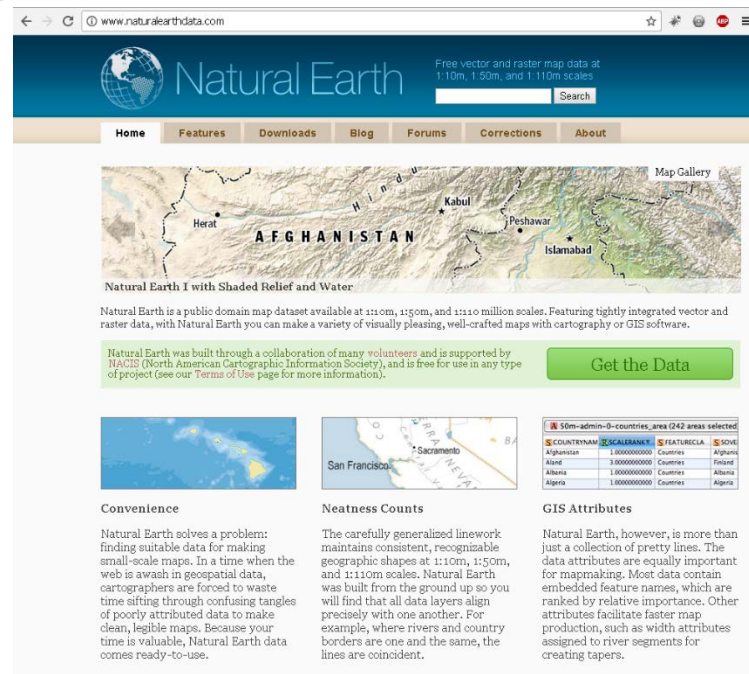
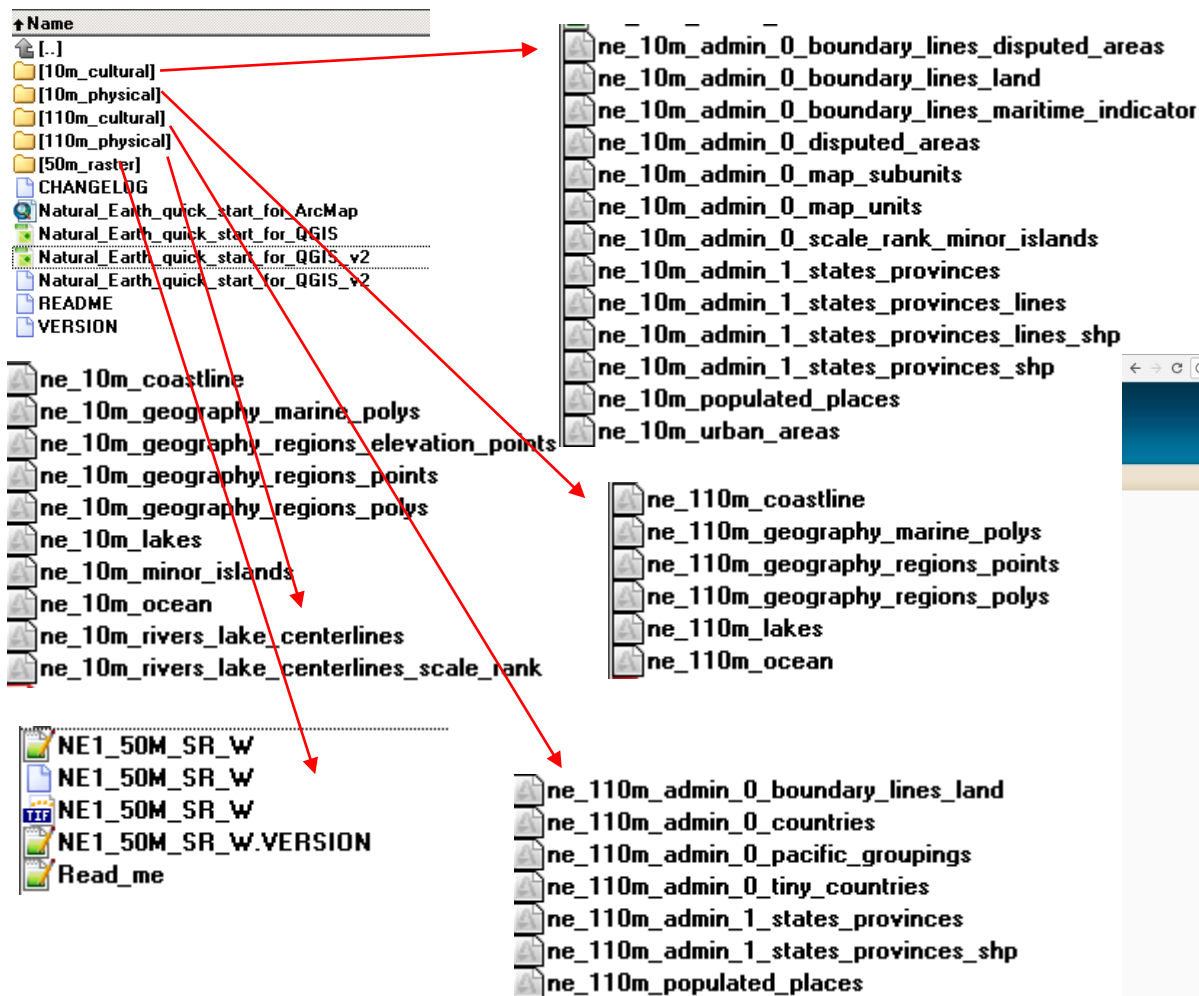


- Editing
- Help Toolbar
- Label Toolbar
- Manage Layers Toolbar
- Map Navigation Toolbar
- Project Toolbar
- Raster Toolbar
- Vector Toolbar
- Web Toolbar
- Layers Panel
- Attributes Toolbar
- Database Toolbar
- Digitizing Toolbar
- Digitizing Tools



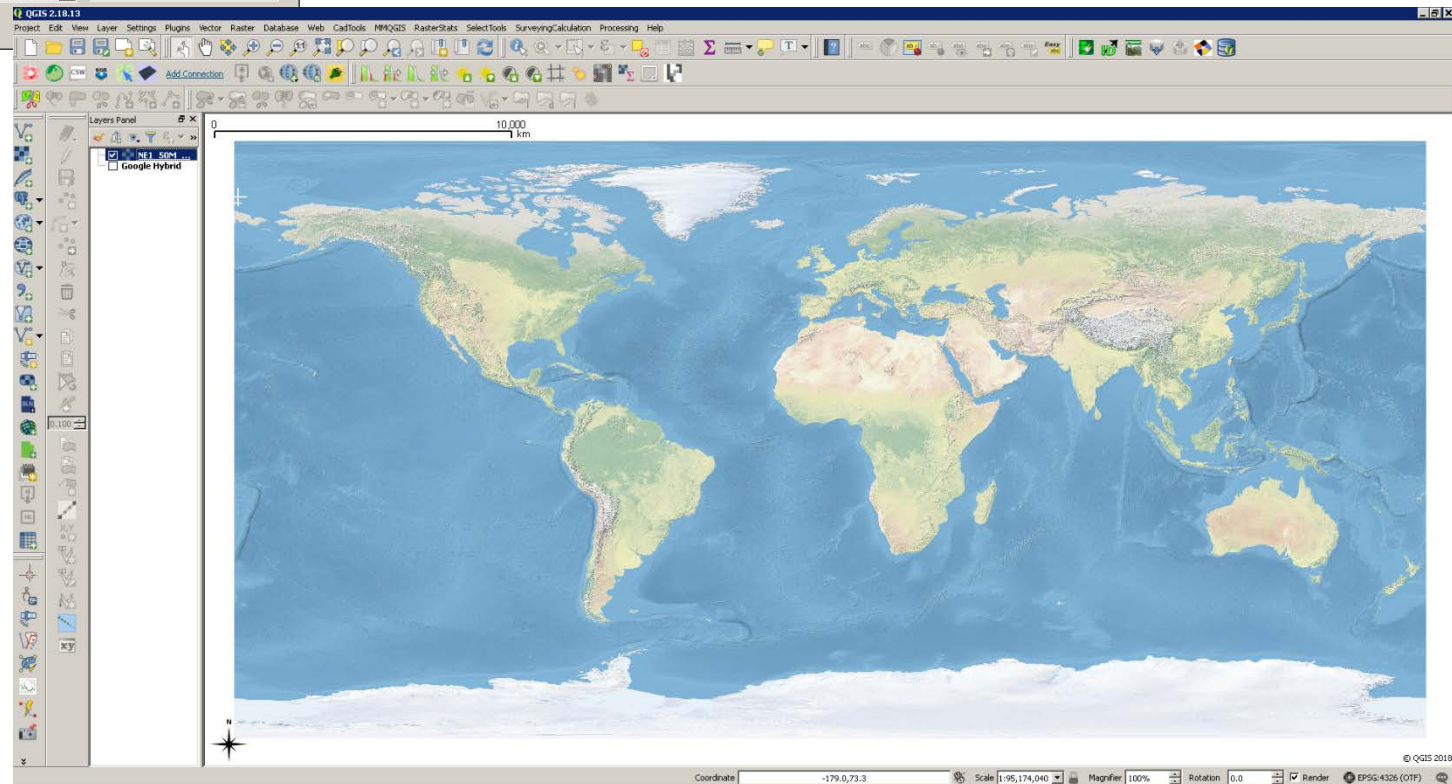
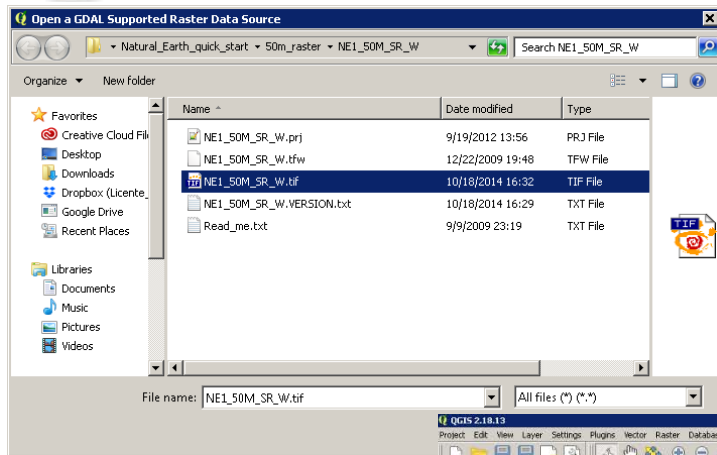


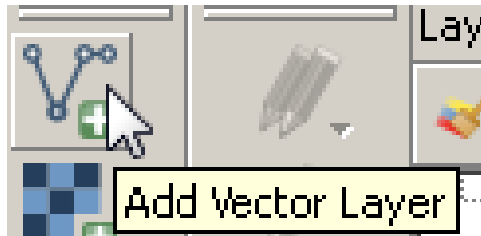
Natural Earth





Raster data (images)

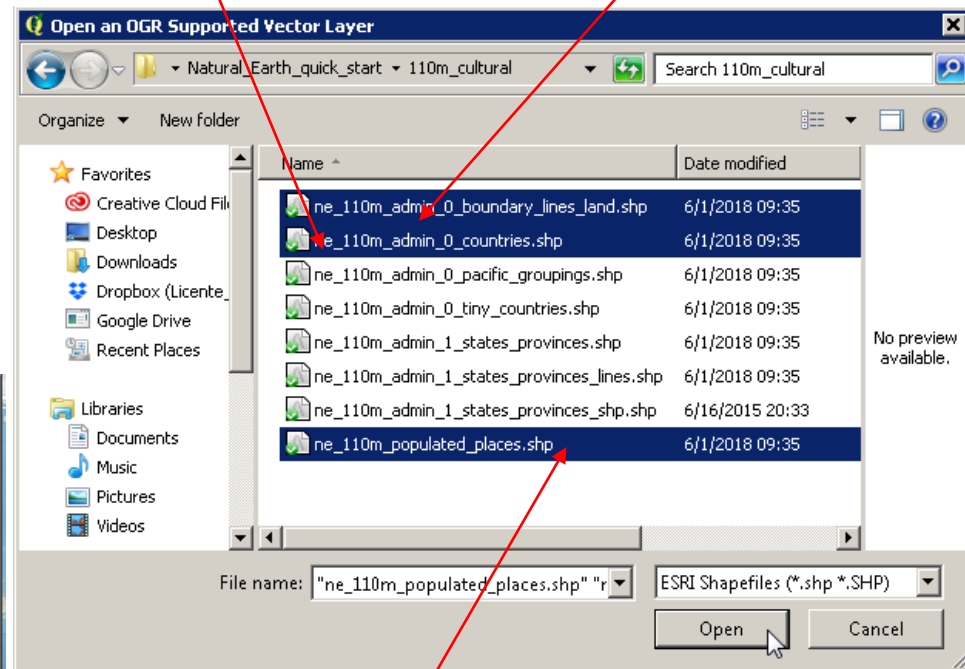
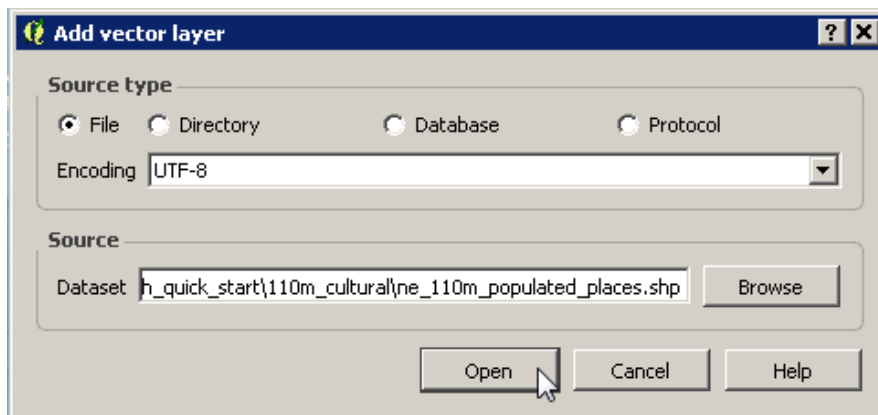
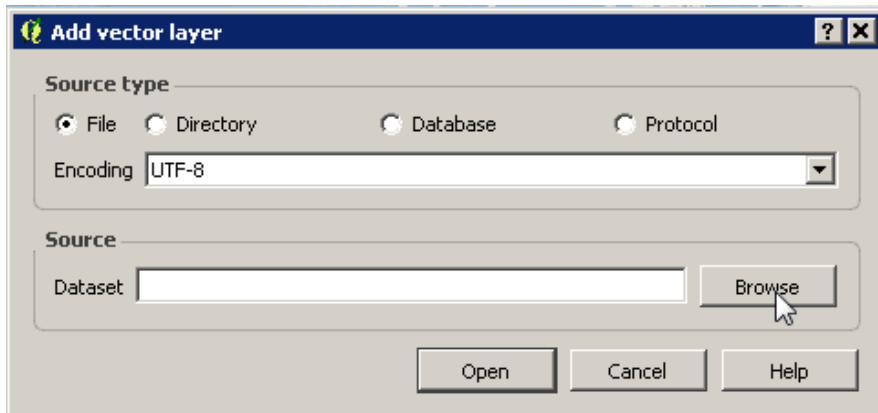




Vector data (drawings)

polygons

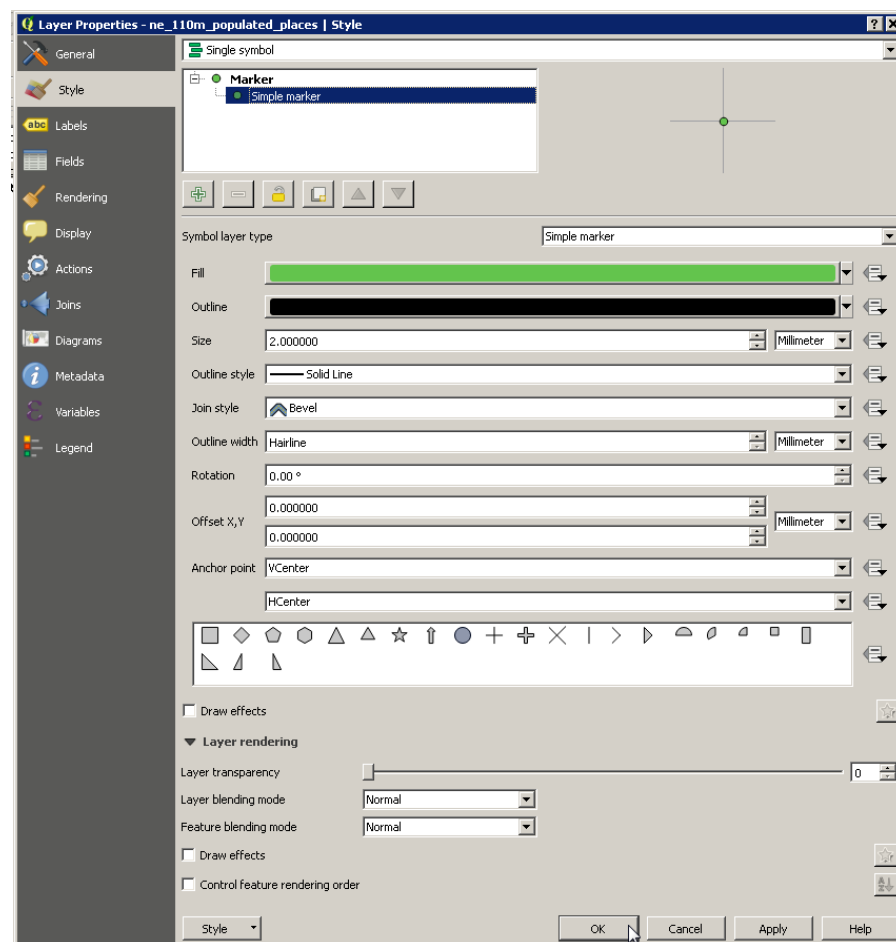
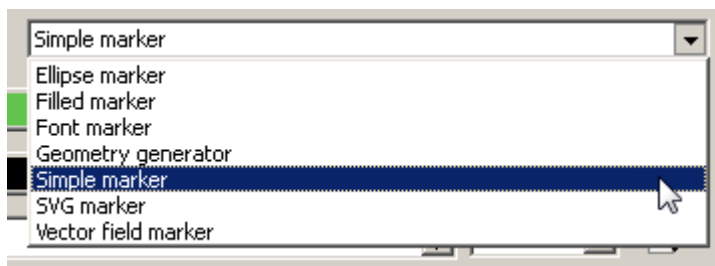
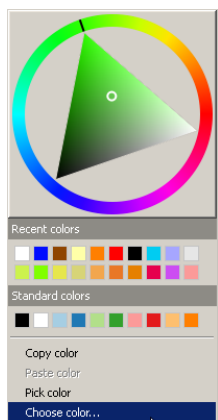
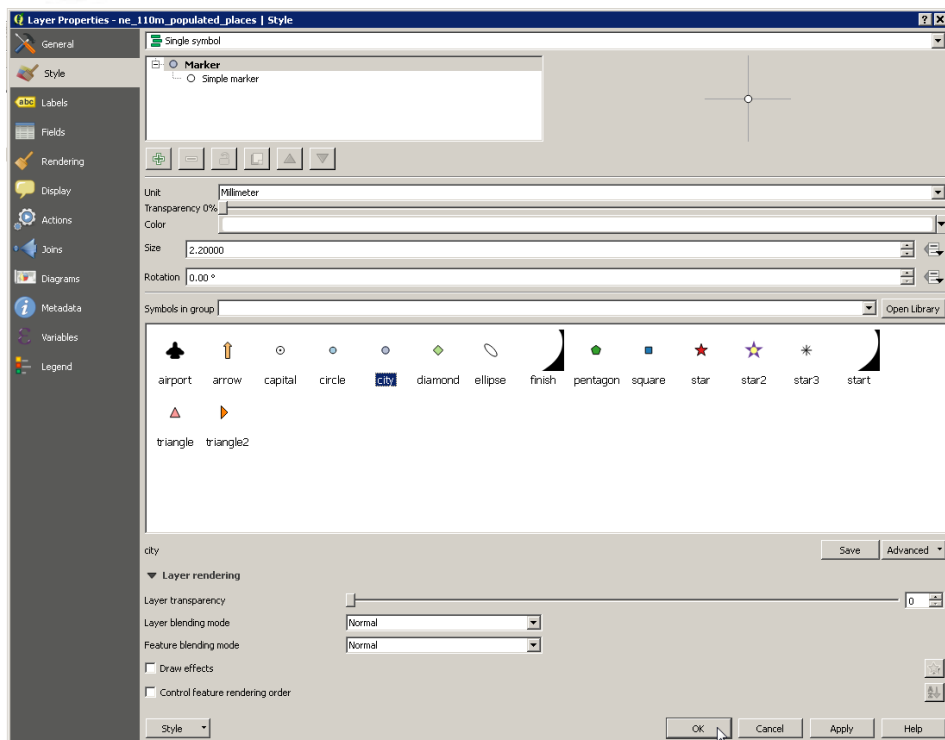
lines



points



Point styling





Line styling

The screenshot displays the QGIS Layer Properties dialog for a layer named 'ne_110m_admin_0_boundary_lines_land'. The 'Style' tab is active, showing the 'Single symbol' section with a 'Line' symbol type. The 'Symbol layer type' is set to 'Simple line'. The 'Color' is set to a teal color. The 'Pen width' is set to 0.260000. The 'Offset' is set to 0.000000. The 'Pen style' is set to 'Solid Line'. The 'Join style' is set to 'No Pen'. The 'Cap style' is set to 'Dash Dot Line'. The 'Use custom dash pattern' checkbox is unchecked. The 'Recent color' list shows a selection of colors, and the 'Standard color' list shows a selection of standard colors. The 'Layer rendering' section is also visible, showing options for 'Layer transparency', 'Layer blending mode', and 'Feature blending mode'.

Layer Properties - ne_110m_admin_0_boundary_lines_land | Style

General

Single symbol

Line

Simple line

Unit: M

Transparency: 0%

Color: [teal]

Width: 0.26000

Symbols in group: [teal]

Bridleway: Car

Motorway: Pedestrian

Unclassified Water

Layer rendering

Layer transparency

Layer blending mode

Feature blending mode

Draw effects

Control feature

Style

Layer Properties - ne_110m_admin_0_boundary_lines_land | Style

General

Single symbol

Line

Simple line

Symbol layer type: Simple line

Color: [teal]

Pen width: 0.260000

Offset: 0.000000

Pen style: Solid Line

Join style: No Pen

Cap style: Dash Dot Line

Use custom dash pattern

Recent color

Standard color

Copy color

Change

Millimeter



Polygon styling

The image displays three overlapping screenshots of the QGIS Layer Properties dialog for a polygon layer, illustrating different styling options.

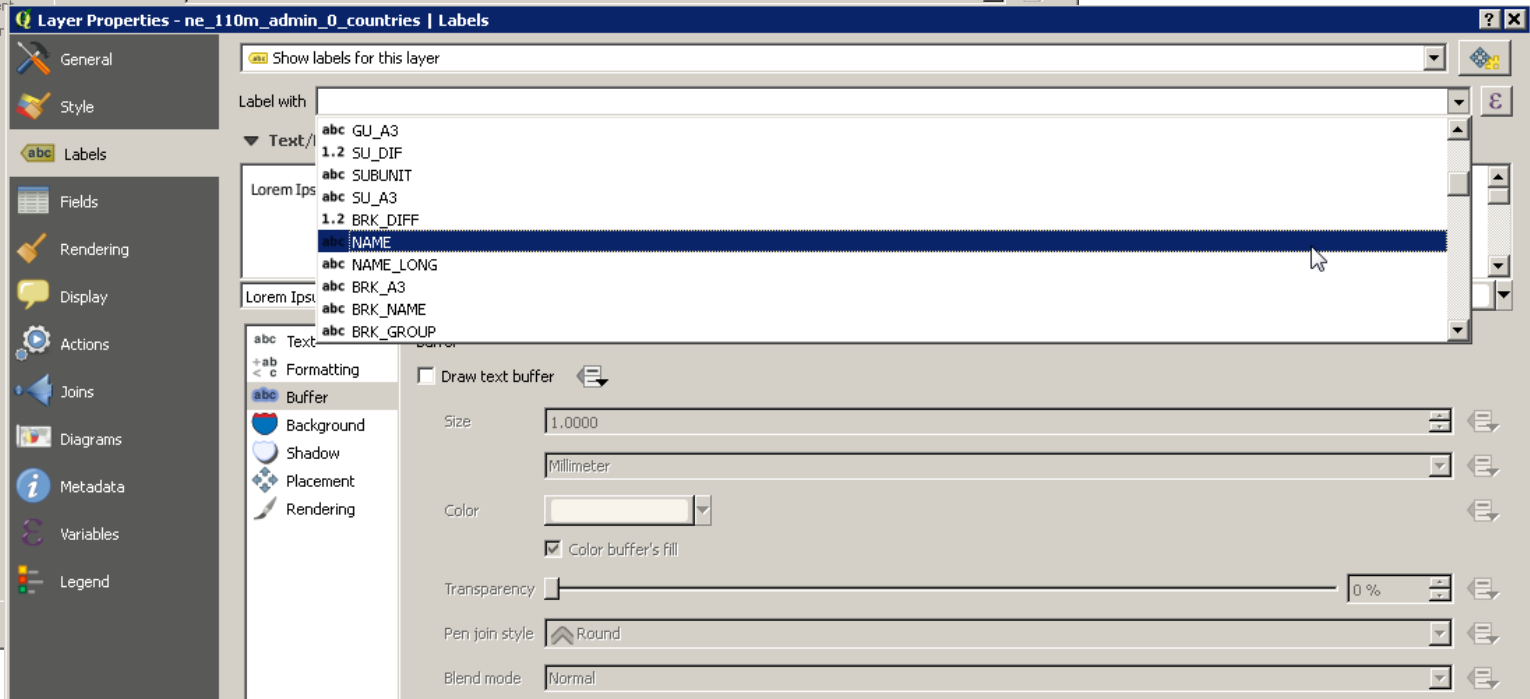
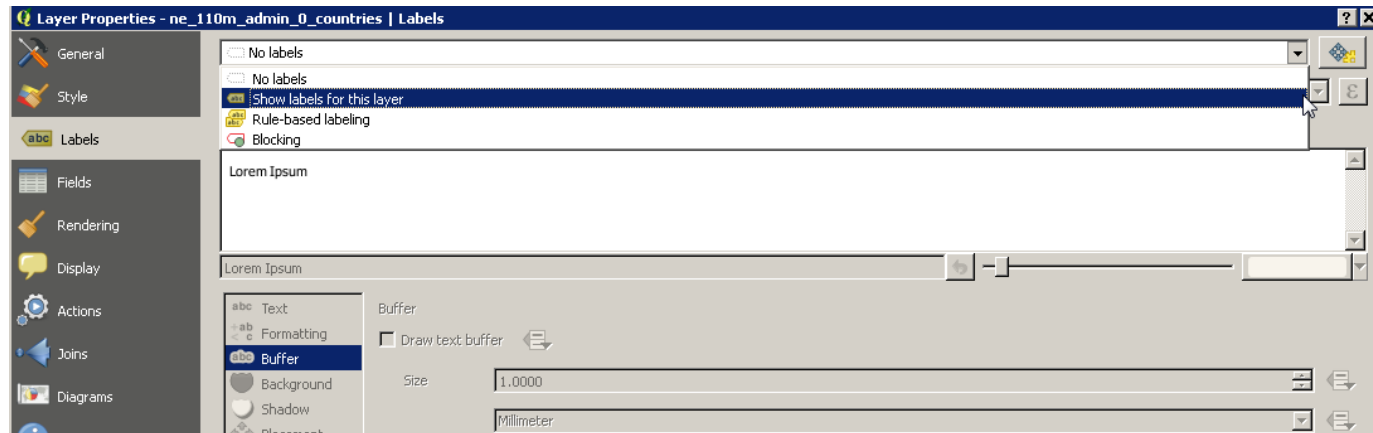
Top Screenshot: Shows the 'Single symbol' tab with the 'Fill' layer selected. The 'Simple fill' option is chosen from the 'Symbol layer type' dropdown.

Middle Screenshot: Shows the 'Single symbol' tab with the 'Simple fill' layer selected. The 'Simple fill' option is chosen from the 'Symbol layer type' dropdown. The 'Fill' color is set to a light yellow. The 'Outline' is set to a solid black line. The 'Join style' is set to 'Bevel'. The 'Outline width' is 0.260000. The 'Offset X,Y' is 0.000000.

Bottom Screenshot: Shows the 'Single symbol' tab with the 'Simple line' layer selected. The 'Simple line' option is chosen from the 'Symbol layer type' dropdown. The 'Color' is set to black. The 'Pen width' is 0.260000. The 'Offset' is 0.000000. The 'Pen style' is set to 'Solid Line'. The 'Join style' is set to 'No Pen'. The 'Cap style' is set to 'Round'. The 'Use custom dash pattern' checkbox is checked. The 'Change' button is visible at the bottom right.

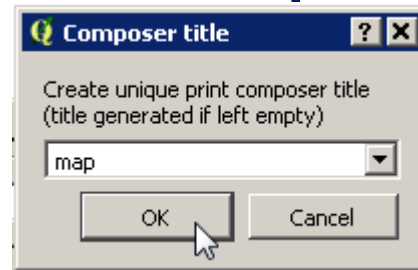
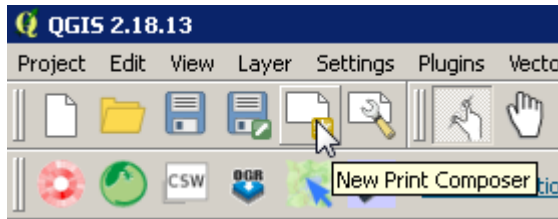


Labels





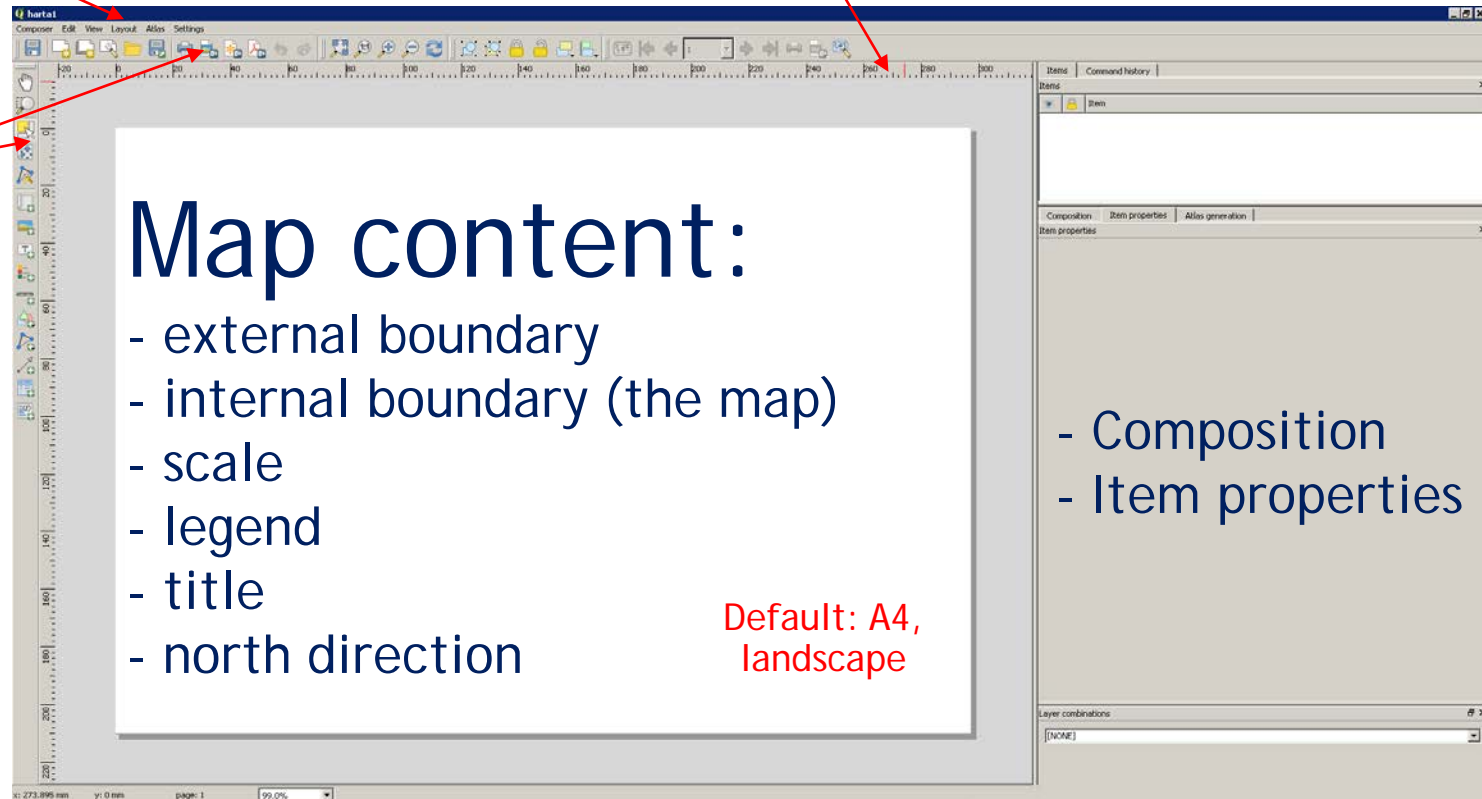
Map Composer



Menus

Rulers

Toolbars



Map content:

- external boundary
- internal boundary (the map)
- scale
- legend
- title
- north direction

Default: A4,
landscape

- Composition
- Item properties



The screenshot displays the Q map Composer manager interface, which is divided into several sections:

- Top Bar:** Contains tabs for "Composer", "Edit", "View", "Layout", "Atlas", and "Settings". Below these are buttons for "Export as PDF", "Zoom full", and "Refresh view".
- Left Panel:** A vertical toolbar with icons for various actions. A scale bar on the left indicates distances from 0 to 100. Labels next to the icons include: "Pan Composer", "Zoom", "Select/Move item", "Move item content", "Edit Nodes Item", "Add new map", "Add image", "Add new label", "Add new legend", "Add new scalebar", "Add Shape", "Add Nodes item", "Add arrow", "Add attribute table", and "Add HTML frame".
- Right Panel:** A settings panel with three tabs: "Composition", "Item properties", and "Atlas generation". The "Composition" tab is active, showing settings for page size, margins, and export options.

Composition Panel Settings:

- Page size:** Presets: A4 (210x297 mm), Width: 297.00, Height: 210.00, Units: mm, Orientation: Landscape.
- Resize page to content:** Top margin (mm): 0.00, Left: 0.00, Right: 0.00, Bottom: 0.00. A "Resize page" button is present.
- Page settings:** Number of pages: 1, Page background: Change...
- Export settings:** Export resolution: 300 dpi, Print as raster: ☐, Save world file: ☐, Reference map: [empty field].

Bottom Panel: A horizontal toolbar with buttons for "Add Rectangle", "Add Triangle", "Add Ellipse", "Add Polygon", and "Add Polyline". Red arrows point from the "Add Shape" and "Add Nodes item" labels in the left panel to the "Add Rectangle" and "Add Polygon" buttons respectively.



External boundary as a rectangle

The screenshot shows the 'map' Composer application interface. The main workspace displays a map with a large white rectangle representing an external boundary. The rectangle is positioned at approximately x: 319.322 mm, y: 153.649 mm, with a width of 320 mm and a height of 220 mm. The right panel shows the 'Item properties' for the selected rectangle, including its shape, position, size, and variables.

Items

- Item
- <rectangle>

Composition | **Item properties** | **Atlas generation**

Item properties

Shape

▼ **Main properties**

Rectangle

Corner radius: 0.00 mm

Style:

► **Position and size**

► **Rotation**

► **Item ID**

► **Rendering**

▼ **Variables**

Variable	Value
► Global	
► Project	
► Composition	
▼ Composer ...	
item_id	
item_uuid	{6b6aa496-b240-4873-8d65-d68b805443e8}
layout_page	1

Layer combinations

[NONE]

status bar: x: 319.322 mm y: 153.649 mm page: 1 99.0% 1 item selected



Adding a map

map

Composer Edit View Layout Atlas Settings

Items Command history

Item
Map 0
<rectangle>

Composition Item properties Atlas generation

Item properties

Map 0

Main properties

Cache [none] Update preview

Scale 114946694

Map rotation 0.00 °

☒ Draw map canvas items

Layers

☐ Follow visibility preset (none)

☐ Lock layers

☐ Lock styles for layers

Extents

X min -189.000

Y min -104.094

X max 189.000

Y max 152.153

Set to map canvas extent

View extent in map canvas

☐ Controlled by atlas

Grids

Overviews

Position and size

Rotation

☐ Frame

Layer combinations

[NONE]

x: 282.446 mm y: 195.869 mm page: 1 99.0% 1 item selected



Adding a grid

map

Composer Edit View Layout Atlas Settings

WORLD MAP

140°W 120°W 100°W 80°W 60°W 40°W 20°W 0° 20°E 40°E 60°E 80°E 100°E 120°E 140°E

80°N 60°N 40°N 20°N 0° 20°S 40°S 60°S 80°S

Font color

Horizontal margin 1.00 mm

Vertical margin 1.00 mm

Horizontal alignment

Left Center Right

Vertical alignment

Top Middle Bottom

Position and size

Rotation

Frame

Background

Item ID

Rendering

Variables

Variable	Value
Global	
Project	
Composition	

Layer combinations

[NONE]

x: 333.484 mm y: 36.3412 mm page: 1 99.0% 1 item selected



Item properties

Map 0

Map 0

Grids

Add a new grid

Draw "Grid 1" grid

Grid type: Solid

CRS: change...

Interval units: Map unit

Interval: X 20.000000000000, Y 20.000000000000

Offset: X 0.000000000000, Y 0.000000000000

Line style: — change...

Blend mode: Normal

Grid frame

Frame style: Zebra

Frame size: Zebra

Frame line thickness: Interior ticks, Exterior ticks, Interior and exterior ticks, Line border

Frame fill colors:

Left divisions: All

Right divisions: All

Top divisions: All

Bottom divisions: All

☒ Left side ☒ Right side

Map 0

Bottom divisions: All

☒ Left side ☒ Right side

☒ Top side ☒ Bottom side

Draw coordinates

Format: Decimal with suffix

Left: Show all, Outside frame, Vertical ascending

Right: Show all, Outside frame, Vertical descending

Top: Show all, Outside frame, Horizontal

Bottom: Show all, Outside frame, Horizontal

Font: Font...

Font color: [Color Picker]

Distance to map frame: 1.00 mm

Coordinate precision: 0

Overviews

Position and size

Rotation



Adding a title

map

Composer Edit View Layout Atlas Settings

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

500 0 1500 3000 4500 6000 km

WORLD MAP

140°W 120°W 100°W 80°W 60°W 40°W 20°W 0° 20°E 40°E 60°E 80°E 100°E 120°E 140°E

80°N 60°N 40°N 20°N 0° 20°S 40°S 60°S 80°S

140°W 120°W 100°W 80°W 60°W 40°W 20°W 0° 20°E 40°E 60°E 80°E 100°E 120°E 140°E

80°N 60°N 40°N 20°N 0° 20°S 40°S 60°S 80°S

Items Command history

Item

<scale bar>
WORLD MAP

Composition Item properties Atlas generation

Item properties

Scalebar

Main properties

Map Map 0

Style Single Box

Units

Scalebar units Meters

Label unit multiplier 1000.000000

Label for units km

Segments

Segments left 2 right 4

Fixed width 150000 units

Fit segment width min 50.00 mm max 150.00 mm

Height 3.00 mm

Display

Fonts and colors

Position and size

Rotation

Frame

Background

Item ID

Rendering

Variables

Layer combinations

[NONE]

x: 331.346 mm y: 52.3741 mm page: 1 99.0% 1 item selected



Adding a legend

map

Composer Edit View Layout Atlas Settings

1500 0 1500 3000 4500 6000 km

WORLD MAP

Legend

- ne_110m_admin_0_boundary_lines_land
- ne_110m_admin_0_countries
- ne_110m_populated_places
- NE1_50M_SR_W

Items

Item

Legend

<scale bar>

Composition Item properties Atlas generation

Item properties

Legend

Main properties

Title Legend

Title alignment Left

Map Map 0

Wrap text on

☒ Resize to fit contents

Legend items

☒ Auto update

Update all

- ne_110m_admin_0_boundary_lines_land
- ne_110m_admin_0_countries
- ne_110m_populated_places
- NE1_50M_SR_W

☐ Only show items inside current atlas feature

Fonts

Columns

Symbol

WMS LegendGraphic

Spacing

Layer combinations

[NONE]

x: 336.156 mm y: 123.186 mm page: 1 99.0% 1 item selected



Thank you
for
attending!