

Coordinate Reference System and QGIS

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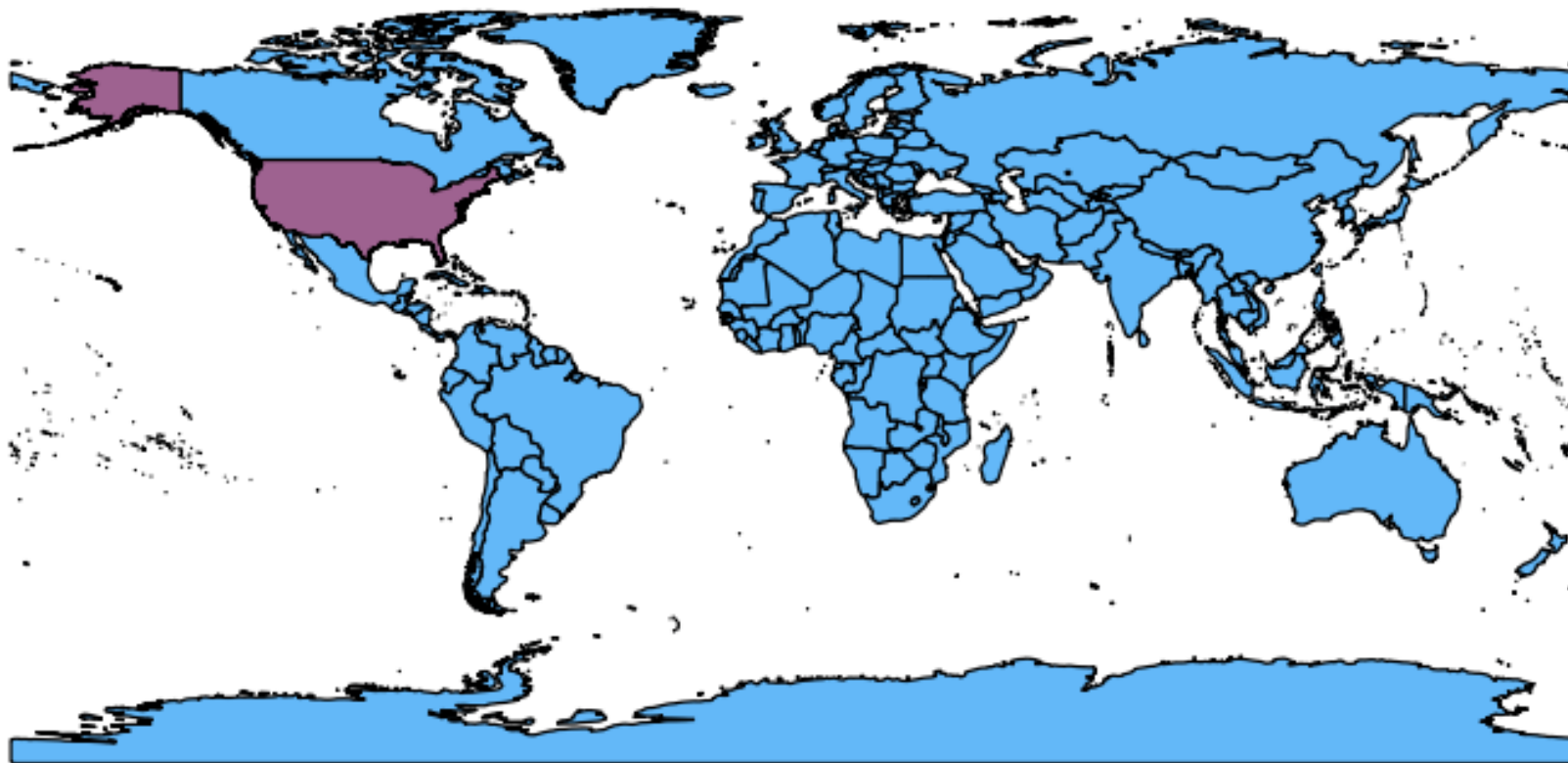


Overview

- Coordinates Reference System (CRS) in QGIS
- How to know CRS in a layer?
- Set CRS
- On-the-fly-reprojection

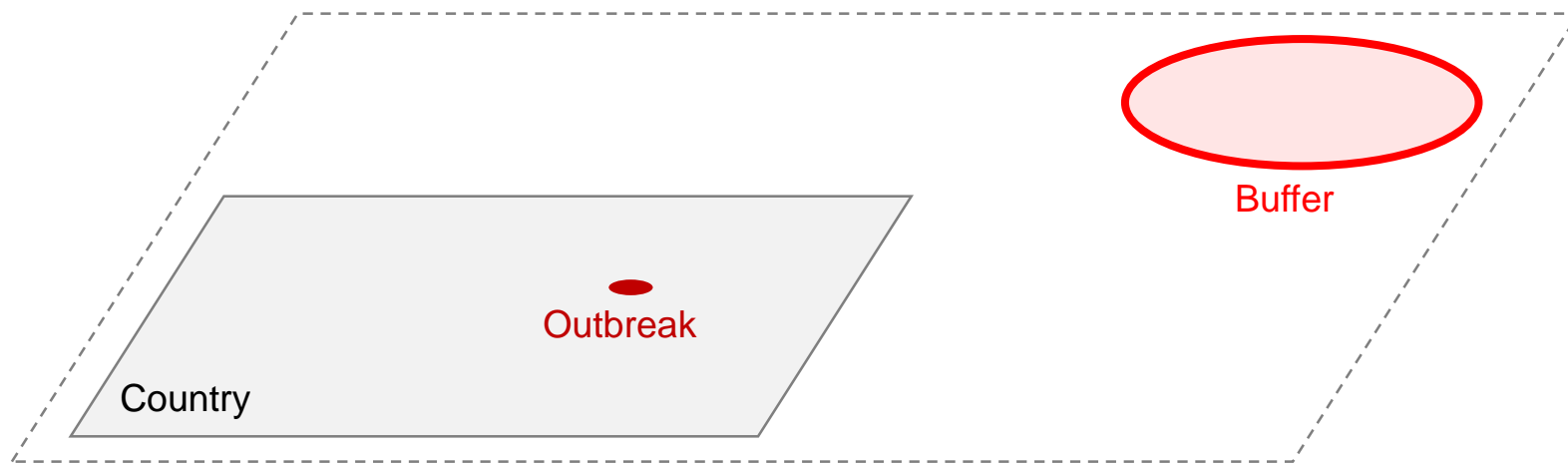
Coordinates Reference System (CRS) in QGIS

Display data in the space that represent the «earth surface»



Different layers with wrong / absent / (*different*) CRSs
generate problems

CRS problems



DATA

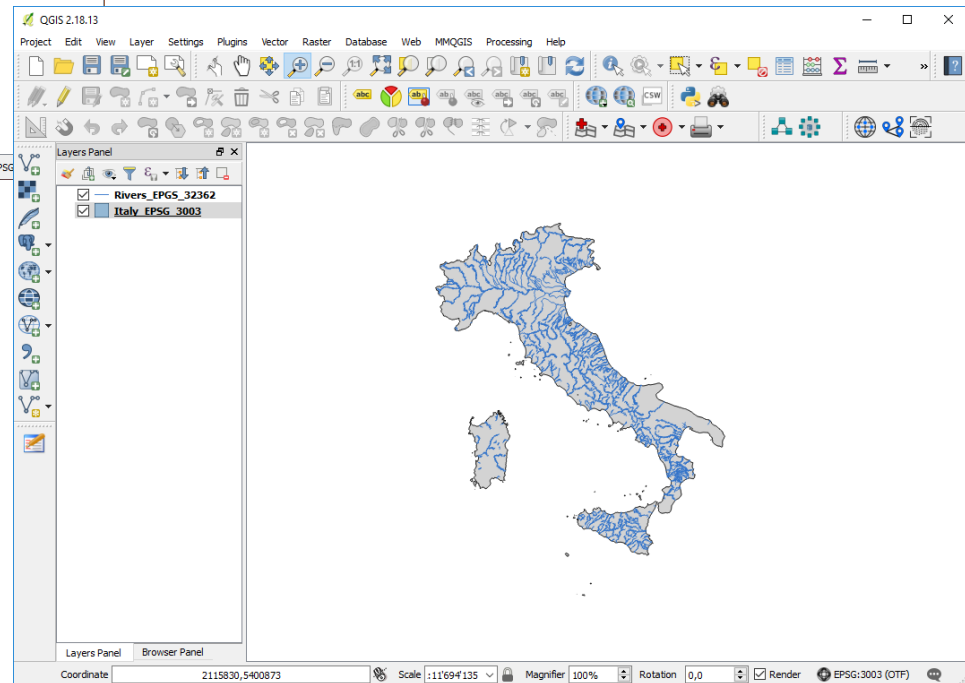
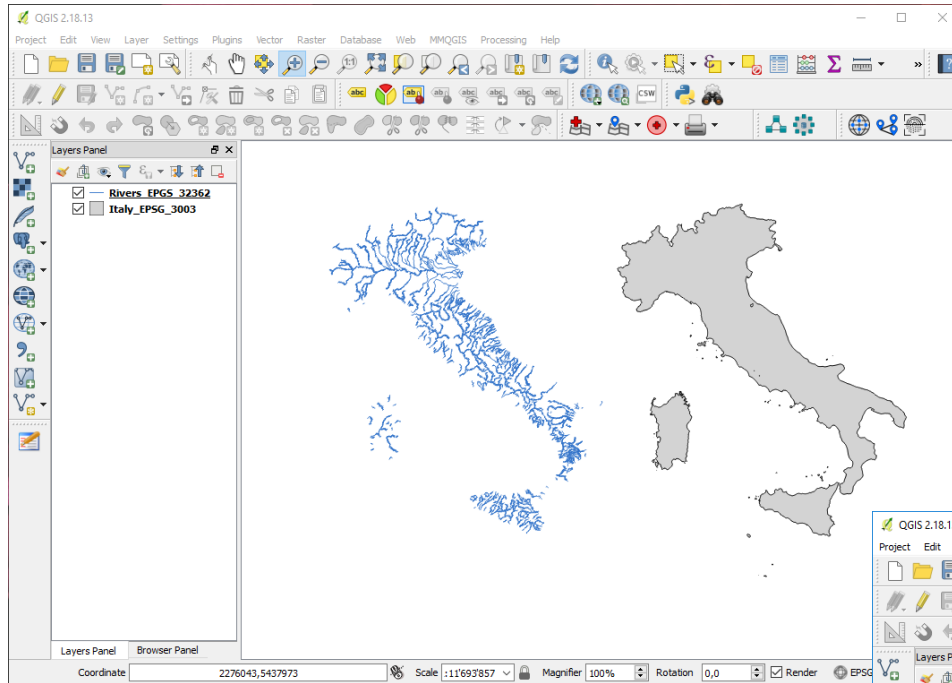
*Project CRS \neq Layer CRS
Layer 1 CRS \neq Layer 2 CRS
Wrong CRS for Layer
No CRS for Layer*



PROBLEMS:

*Visualization
Spatial operation
Measures*

CRS problems



How to know CRS in a layer?

- You are the data owner or the data producer
 - *you know everything about it* -
- You receive data from others
 - *they know everything about it and they have to tell you* -

Spatial Reference are **MANDATORY** to work with GIS

All spatial information **MUST** be present in the
METADATA

Metadata

▼ Description

Short name A name used to identify the layer. The short name is a text string used for machine-to-machine communication.

Title The title is for the benefit of humans to identify layer.

Abstract

Keyword list List of keywords separated by comma to help catalog searching.

DataUrl An URL of the data presentation. Format

▼ Attribution

Title Attribution's title indicates the provider of the data layer.

Url Attribution's url gives a link to the webpage of the provider of the data layer.

▼ MetadataUrl

Url The URL of the metadata document.

Type Format

▼ LegendUrl

Url An URL of the legend image. Format

Metadata

General

Storage type of this layer

ESRI Shapefile

Description of this provider

OGR data provider (compiled against GDAL/OGR library version 2.1.3, running against GDAL/OGR library version 2.1.3)

Source for this layer

X:\gis\Corsi\Corso GIS Cina 2017\presentazioni\day3_20180314\practical_exercise\data\es2\Veneto_Province.shp

Geometry type of the features in this layer

Polygon (WKB type: "Polygon")

The number of features in this layer

1049

Capabilities of this layer

Add Features, Delete Features, Change Attribute Values, Add Attributes, Delete Attributes, Rename Attributes, Create Spatial Index, Create Attribute Indexes, Fast Access to Features at ID, Change Geometries

Extents

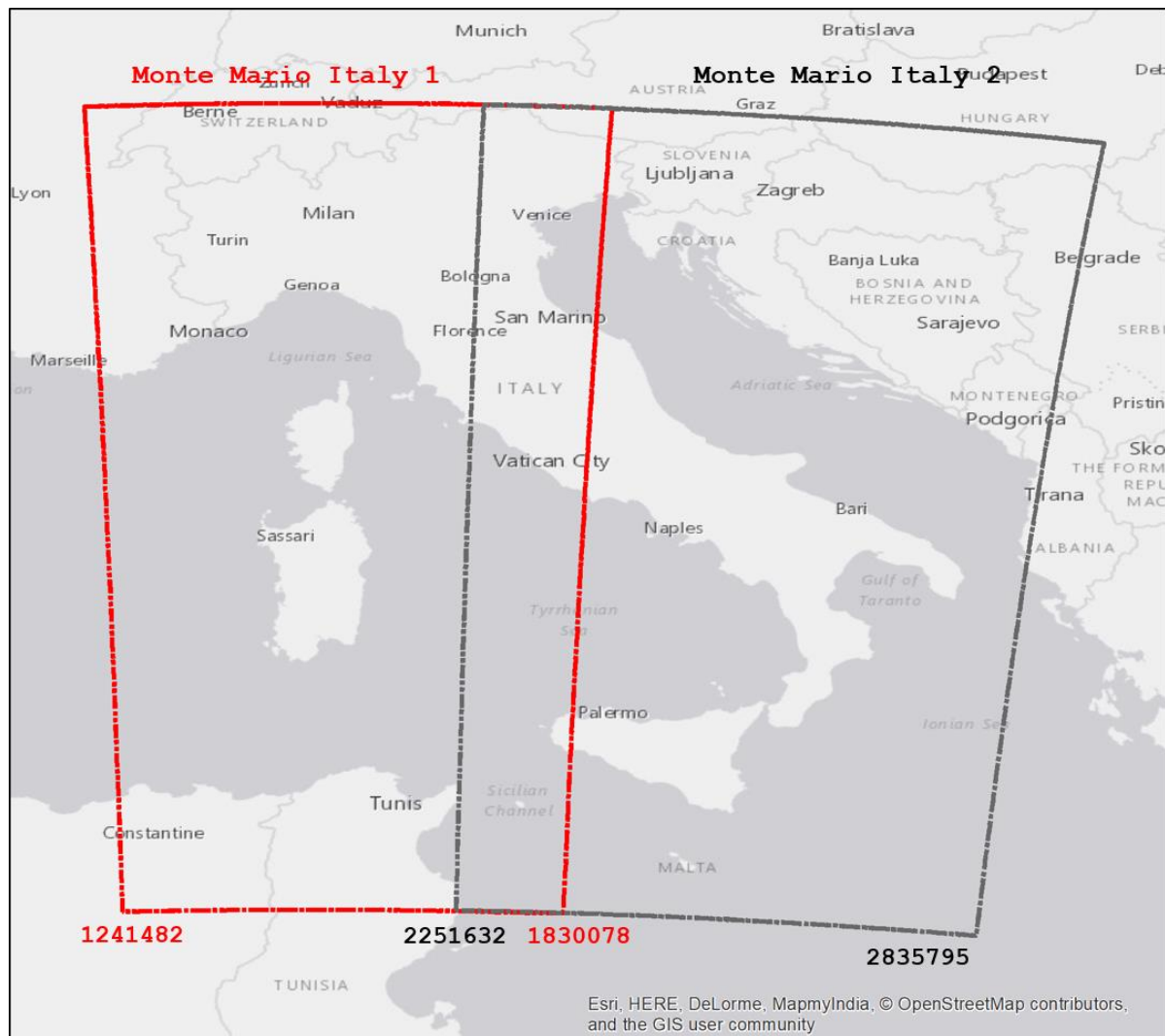
In layer spatial reference system units

xMin,yMin 1632269.35,4975250.49 : xMax,yMax 1804141.90,5102550.03

Layer Spatial Reference System

+proj=tmerc +lat_0=0 +lon_0=9 +k=0.9996 +x_0=1500000 +y_0=0 +ellps=intl +towgs84=-104.1,-49.1,-9.9,0.971,-2.917,0.714,-11.68 +units=m +no_defs

CRS example – Monte Mario Italy 1

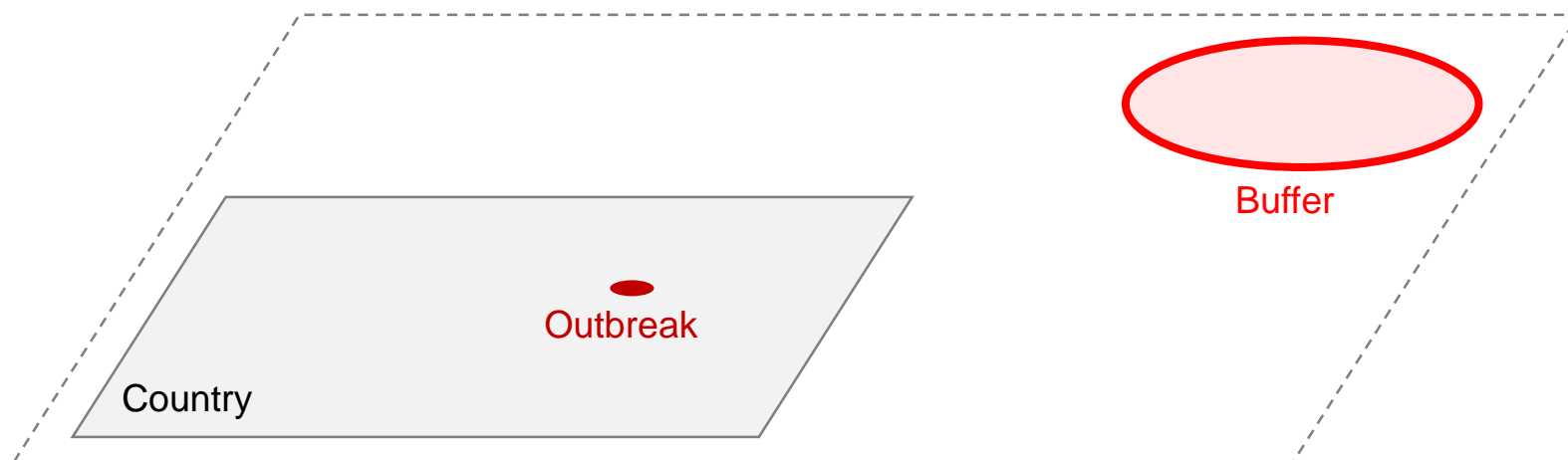


CRS example – WGS84

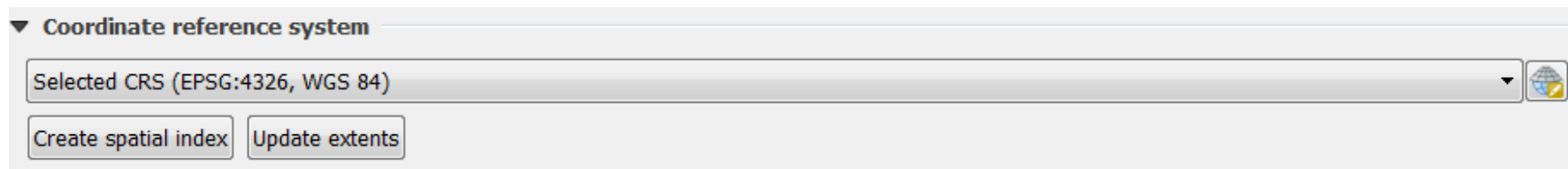


Fix CRS problems

Display data with a CRS in a map with a different CRS

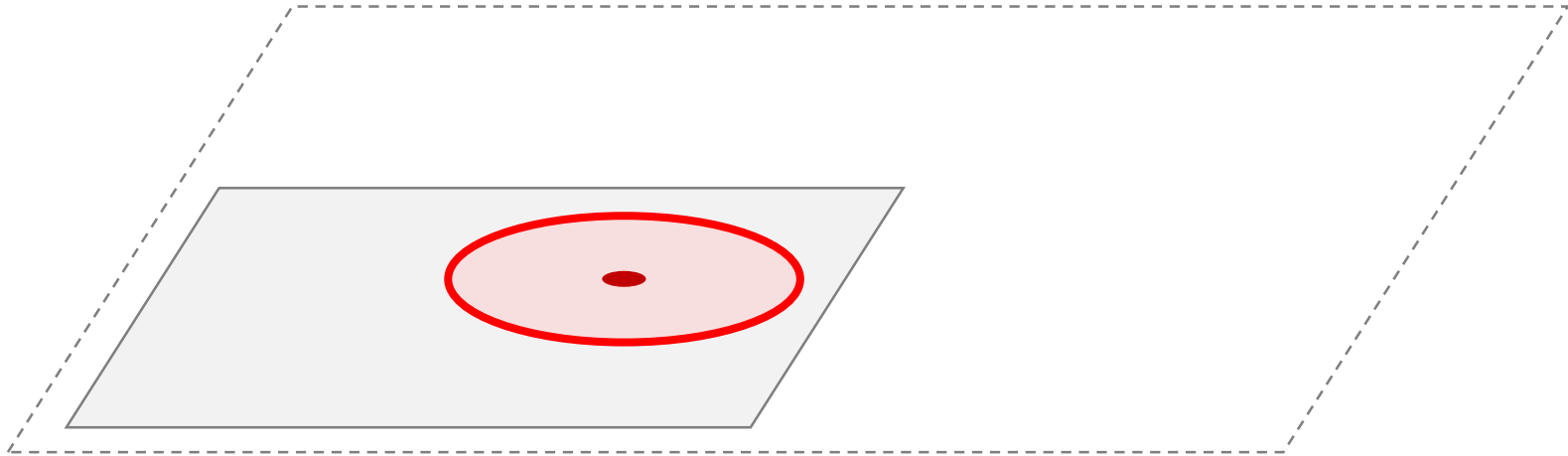


Select the layer and set the CRS



Reprojection

Change the CRS → Change the way to display data

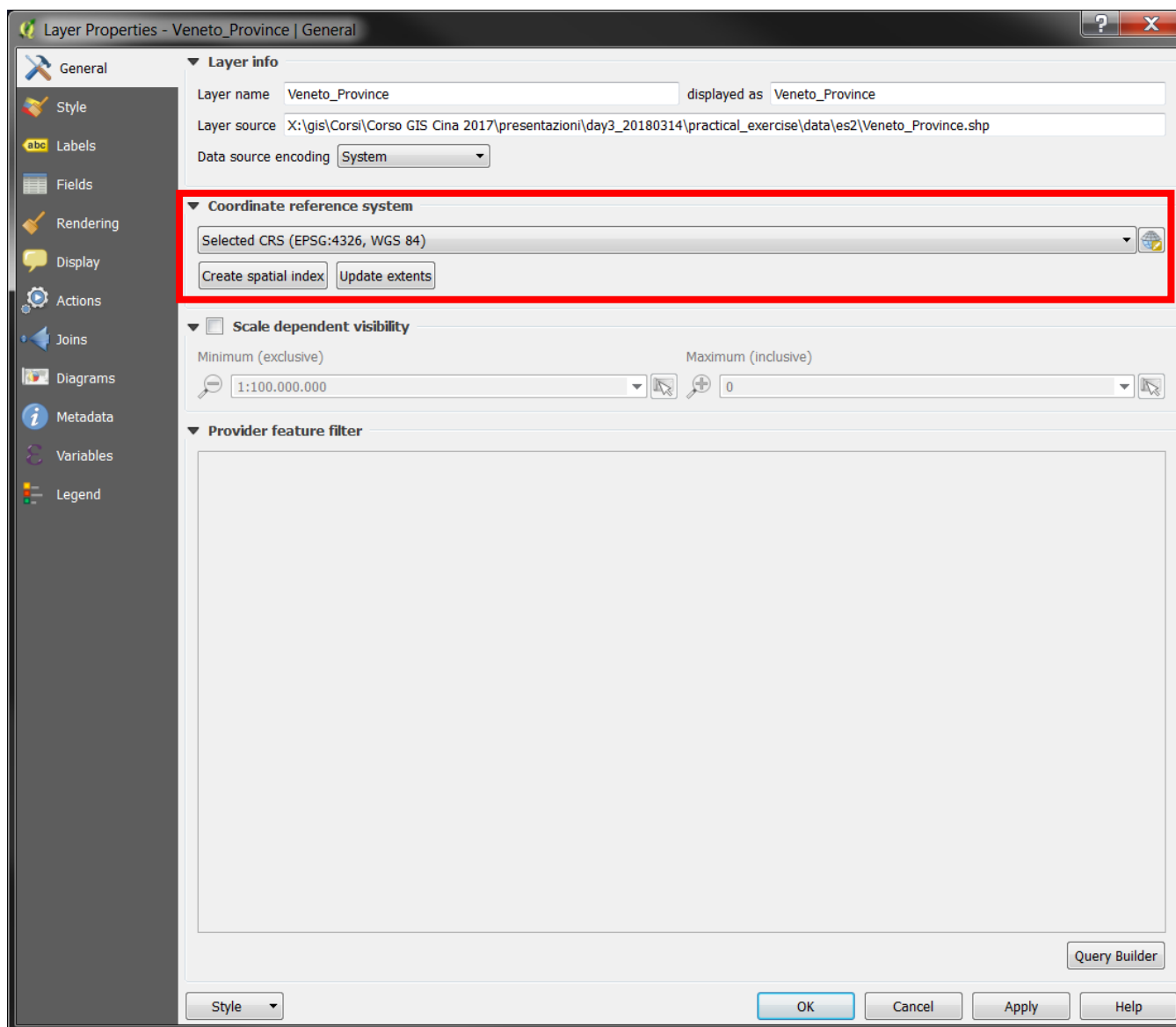


- all features are reprojected, but original data doesn't change
- to save data in new CRS you must save them in a new file

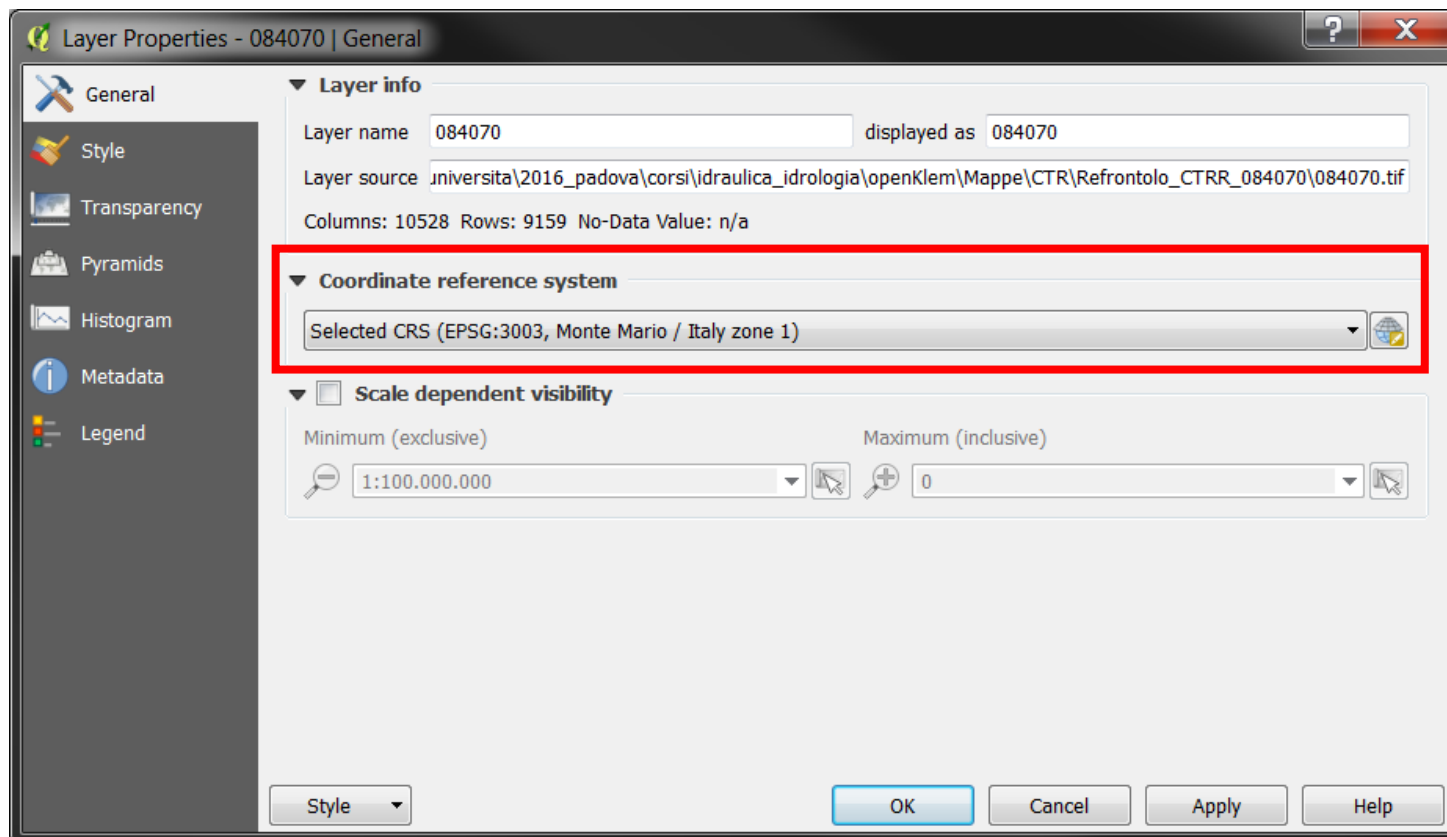
Coordinates Reference System (CRS) in QGIS

- Project CRS
- Single Layer CRS

Set CRS – Single vector layer

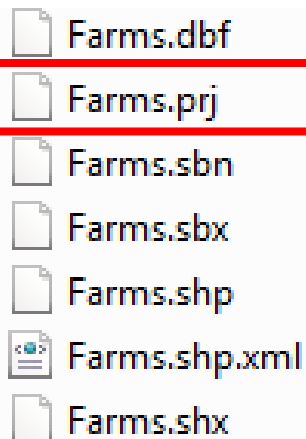


Set CRS – Single raster layer

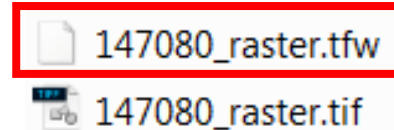


CRS in .shp and .tif

Shape file

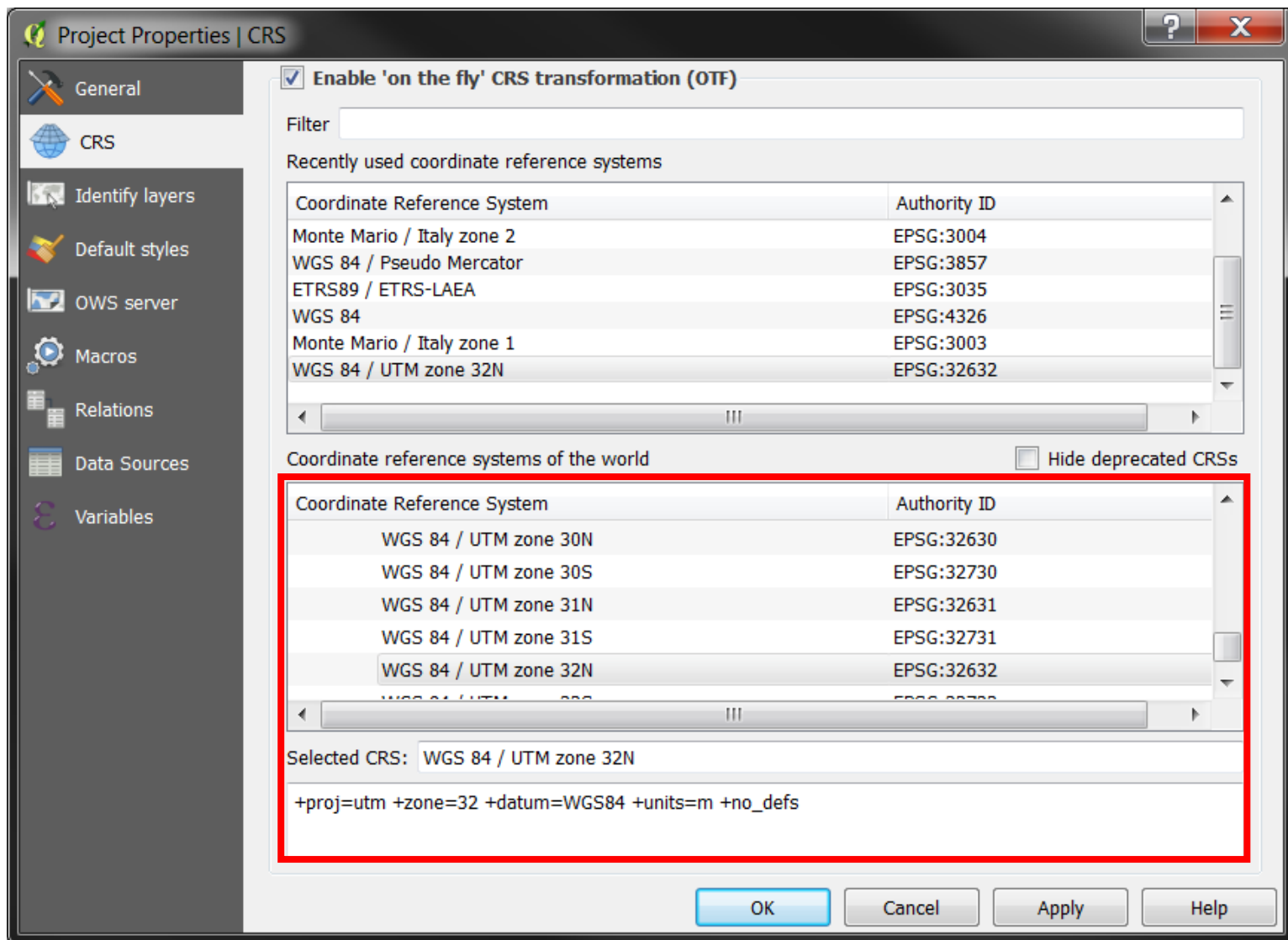


Raster file

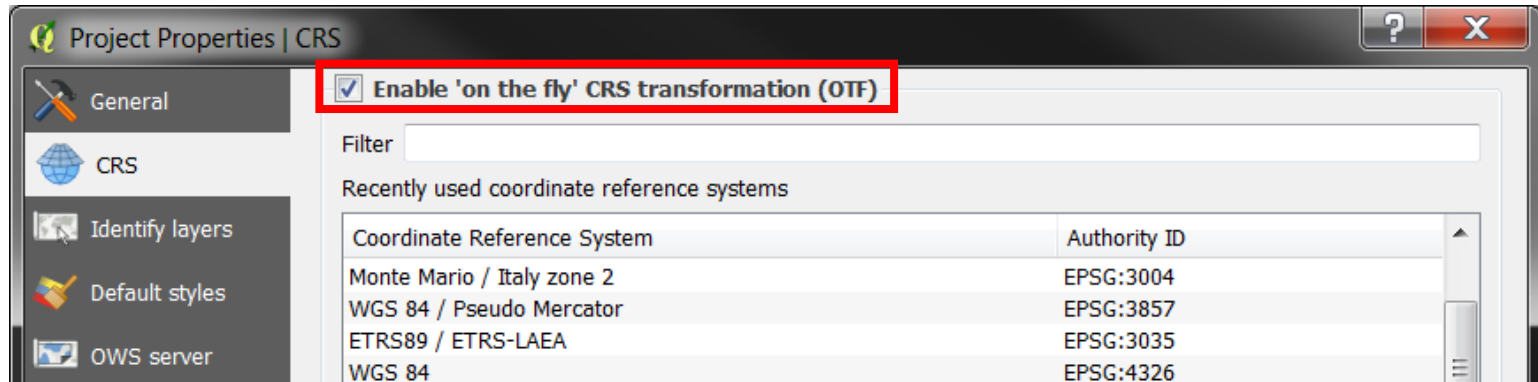


CRS management in vector and raster
are quite different

Set CRS – QGIS Project



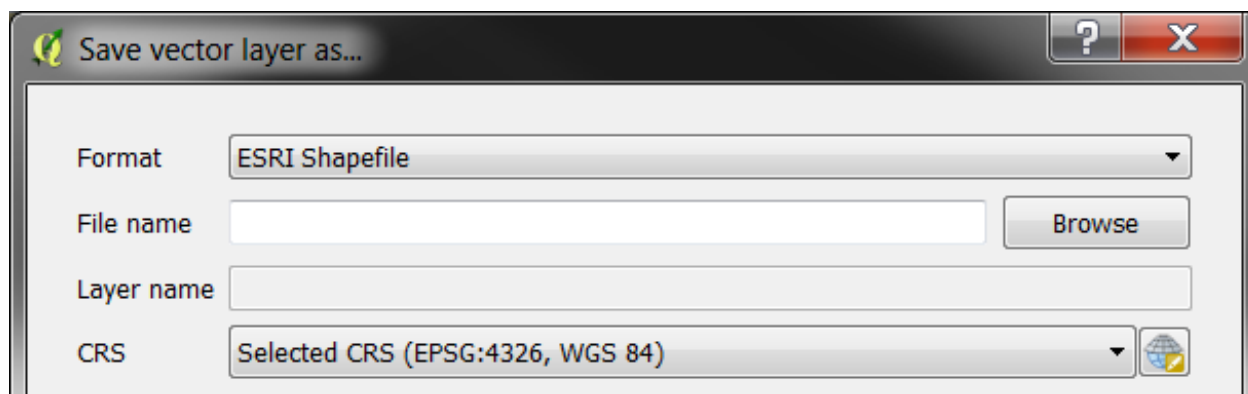
On-the-fly Reprojection



- Helps to automatically display data in the right CRS
- if the layer doesn't have CRS, it automatically use WGS84

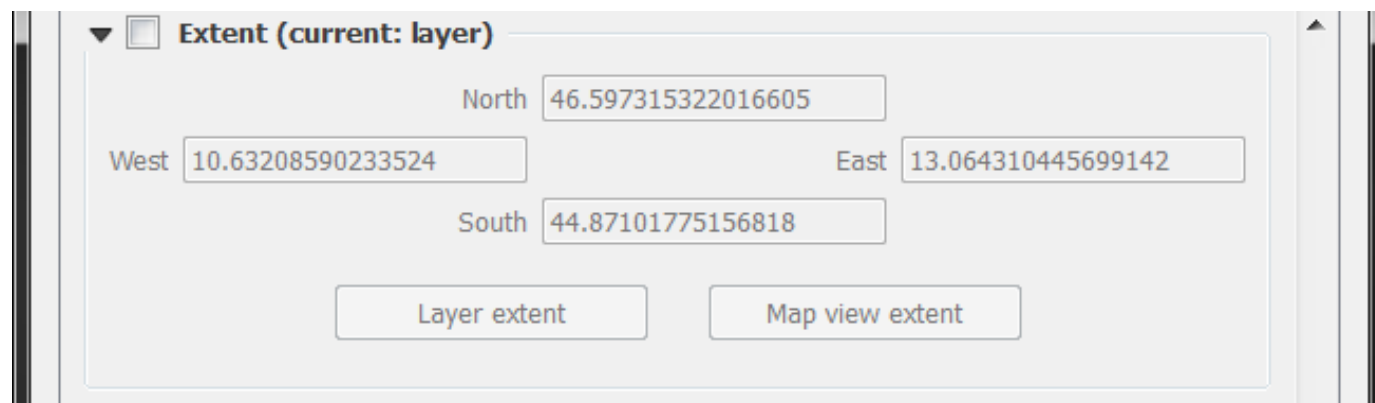
Save data with different projection

- Save layer



The screenshot shows a dialog box titled "Save vector layer as...". It contains the following fields and controls:

- Format:** A dropdown menu set to "ESRI Shapefile".
- File name:** An empty text input field with a "Browse" button to its right.
- Layer name:** An empty text input field.
- CRS:** A dropdown menu set to "Selected CRS (EPSG:4326, WGS 84)" with a globe icon to its right.



The screenshot shows a dialog box titled "Extent (current: layer)". It contains the following fields and controls:

- Extent (current: layer):** A checkbox that is currently unchecked.
- North:** A text input field containing the value "46.597315322016605".
- West:** A text input field containing the value "10.63208590233524".
- East:** A text input field containing the value "13.064310445699142".
- South:** A text input field containing the value "44.87101775156818".
- Layer extent:** A button.
- Map view extent:** A button.

Coordinates Reference System (CRS) in QGIS

- QGIS automatically set the CRS to the first layer CRS loaded
 - If none CRS is defined, WGS84 is setted by default
 - It is possible to change CRS everytime you need, and data will be reprojected
-
- If its possible work with layer with the **same CRS**
 - If you need to evaluate distances or areas, use a CRS in planimetric projection (*metric*)

Practical exercise (3.4)

3_4_ex_crs.docx

objectives

- Verify CRS
- Manage CRS