

An Introduction to GIS Fundamentals

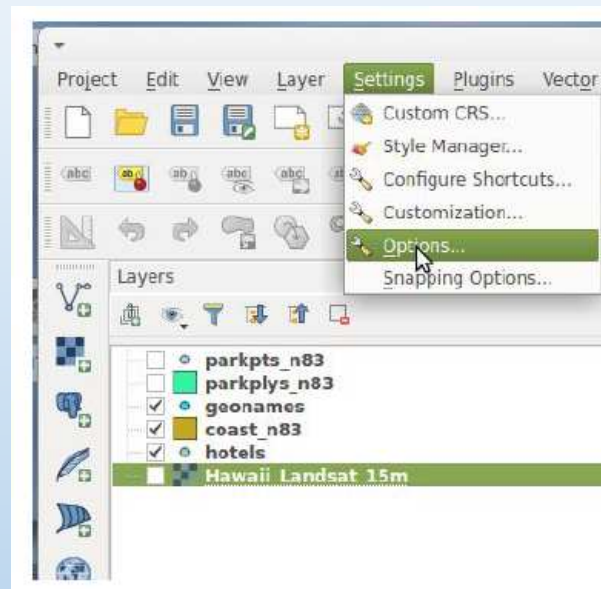
PART 3. QGIS Configuration



QGIS Project Configuration

Project Configuration: Settings > Options

These change the default settings for **ALL QGIS PROJECT FILES**

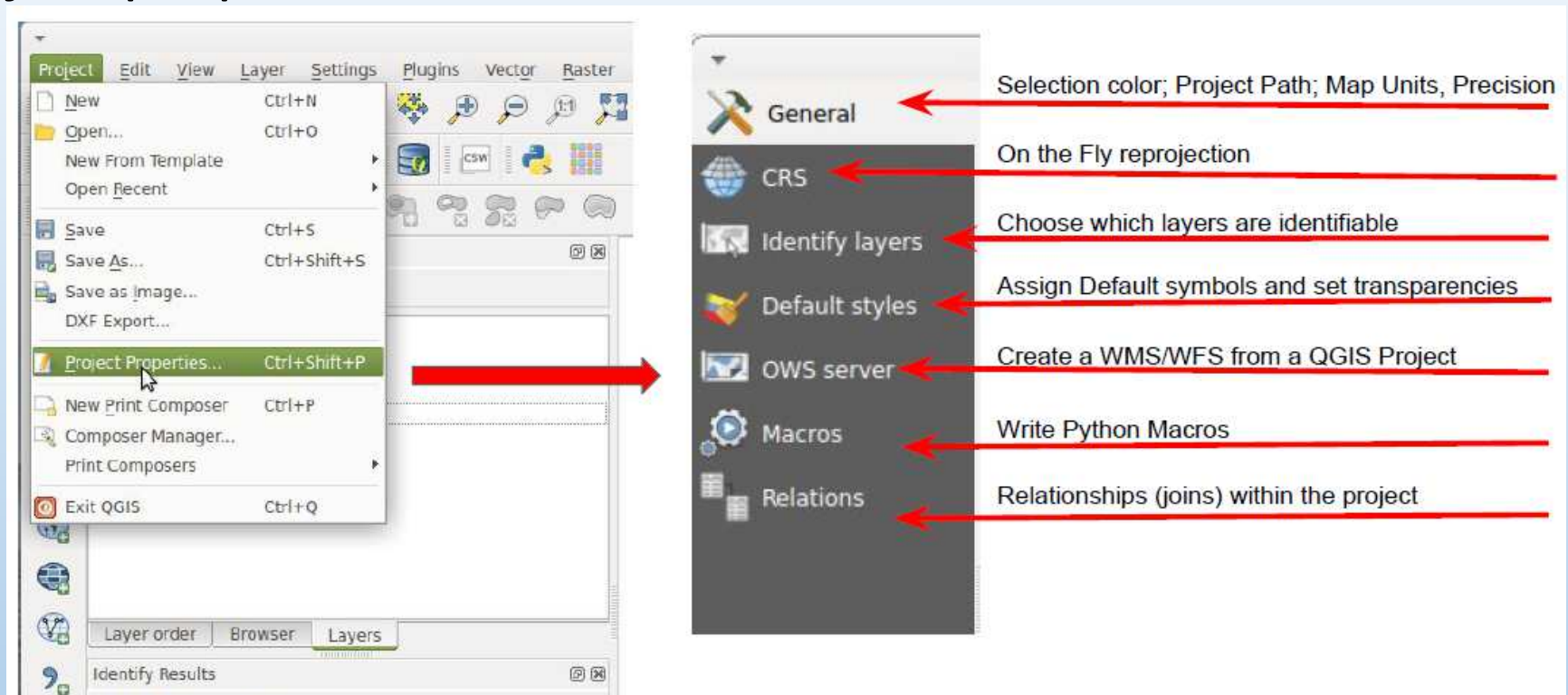


	General	Application Style, Fonts, Project File Behavior
	System	Environment Variable for QGIS and Plugins
	Data Sources	Feature Attributes and Table: Data Source
	Rendering	Vector and Raster Rendering Behaviors
	Colors	Default Colors
	Canvas & Legend	Layer and Map Appearance
	Map Tools	Identify and Measure Tool Settings
	Composer	Defaults for Map Composer
	Digitizing	Snapping and Digitizing Tool Settings
	GDAL	Raster and Pyramid Driver Options
	CRS	Projection Information
	Locale	Override Local Language Settings
	Network	Point to local WMS and cache settings

QGIS is extremely customizable !

QGIS Project Configuration

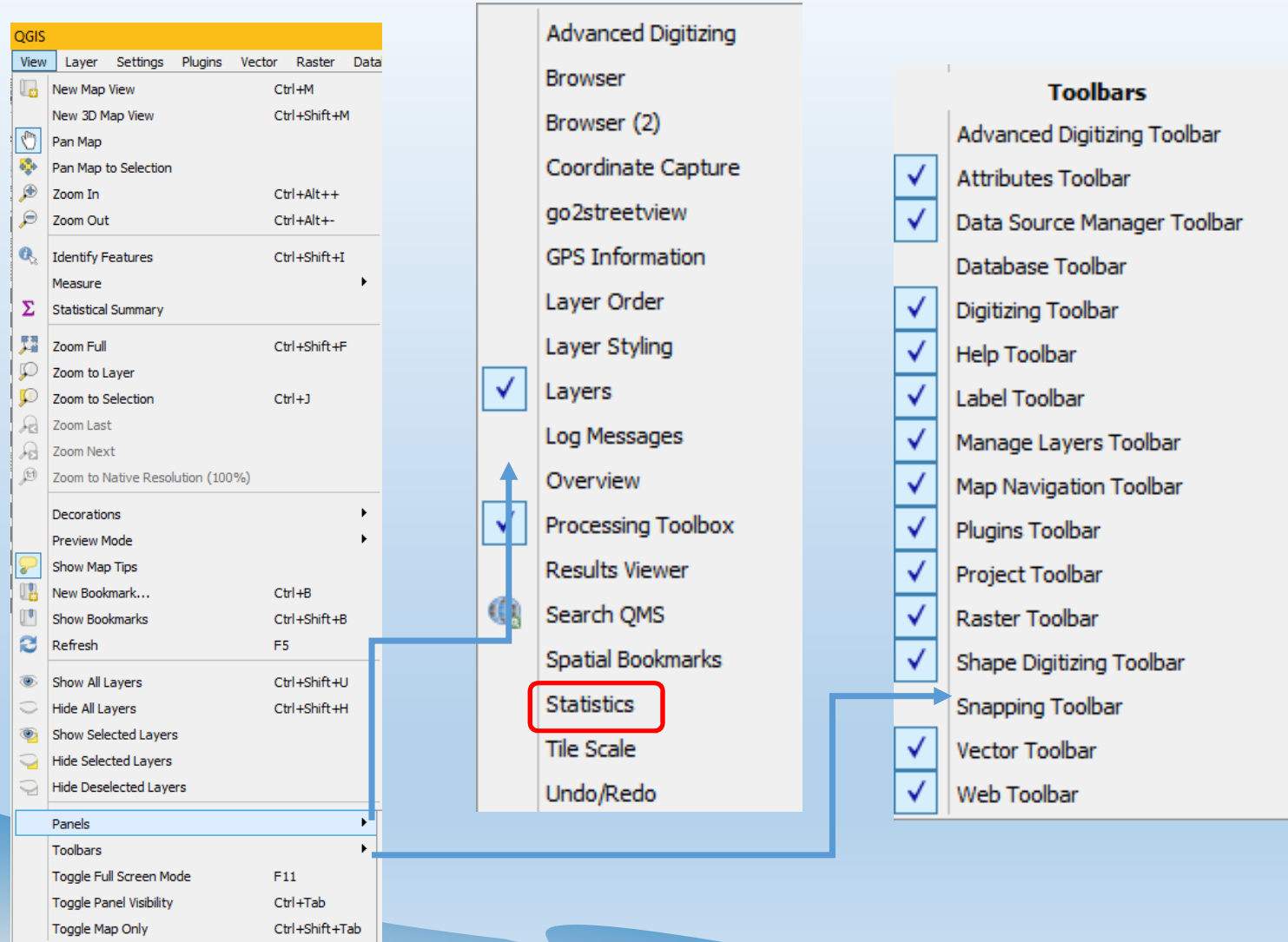
Project > Project properties



These change the default project settings for **the current QGIS project**

QGIS Project Configuration: Panels, Toolbars, Plugins

- ❑ Turn them on and off by going to View > Panels or Toolbars
- ❑ Panels provide interactive windows, eg. Layers, GPS Information, toolbox
- ❑ Toolbars are a grouping of tools
- ❑ Panels/Toolbars can also be added/removed by right-clicking on the toolbar area



The screenshot shows the QGIS View menu with the following items:

- New Map View (Ctrl+M)
- New 3D Map View (Ctrl+Shift+M)
- Pan Map
- Pan Map to Selection
- Zoom In (Ctrl+Alt++)
- Zoom Out (Ctrl+Alt+-)
- Identify Features (Ctrl+Shift+I)
- Measure
- Statistical Summary
- Zoom Full (Ctrl+Shift+F)
- Zoom to Layer
- Zoom to Selection (Ctrl+J)
- Zoom Last
- Zoom Next
- Zoom to Native Resolution (100%)
- Decorations
- Preview Mode
- Show Map Tips
- New Bookmark... (Ctrl+B)
- Show Bookmarks (Ctrl+Shift+B)
- Refresh (F5)
- Show All Layers (Ctrl+Shift+U)
- Hide All Layers (Ctrl+Shift+H)
- Show Selected Layers
- Hide Selected Layers
- Hide Deselected Layers
- Panels**
 - Advanced Digitizing
 - Browser
 - Browser (2)
 - Coordinate Capture
 - go2streetview
 - GPS Information
 - Layer Order
 - Layer Styling
 - Layers
 - Log Messages
 - Overview
 - Processing Toolbox
 - Results Viewer
 - Search QMS
 - Spatial Bookmarks
 - Statistics**
 - Tile Scale
 - Undo/Redo
- Toolbars**
 - Advanced Digitizing Toolbar
 - Attributes Toolbar
 - Data Source Manager Toolbar
 - Database Toolbar
 - Digitizing Toolbar
 - Help Toolbar
 - Label Toolbar
 - Manage Layers Toolbar
 - Map Navigation Toolbar
 - Plugins Toolbar
 - Project Toolbar
 - Raster Toolbar
 - Shape Digitizing Toolbar
 - Snapping Toolbar
 - Vector Toolbar
 - Web Toolbar
- Toggle Full Screen Mode (F11)
- Toggle Panel Visibility (Ctrl+Tab)
- Toggle Map Only (Ctrl+Shift+Tab)

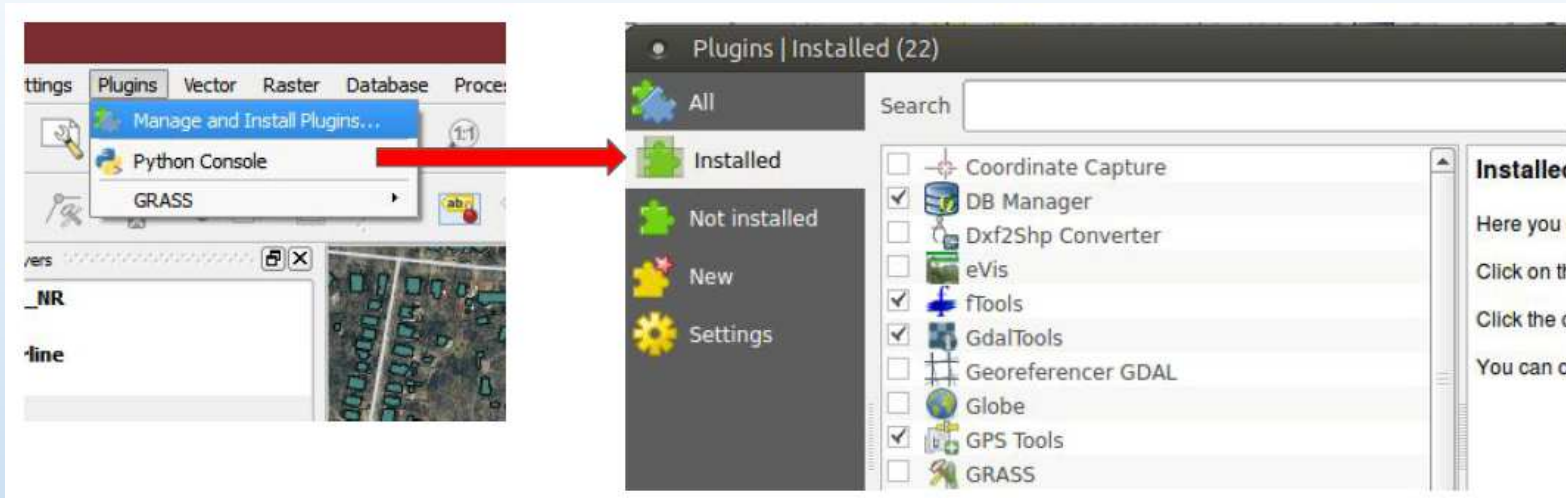
Training event (C1) of Daylighting rivers Florence Oct. 1st – 5th 2018

QGIS Project Configuration: Panels, Toolbars, Plugins

Plugins:

- Plugins are addons that introduce new features or functions to QGIS
- **Adding, removing, activating** and **deactivating** of plugins are all done through **Plugins > Manage and Install Plugins...**
- Implemented as either core or external plugins
- **Core Plugins (Installed)** are developed by the QGIS dev team and included in distribution
- **External Plugins (Get more)** or 3rd Party Plugins are stored in external repositories and maintained by authors
- Within the **Plugin Manager** under **Settings**, choose **Check for updates on startup** and then the frequency to keep them up to date

QGIS Project Configuration: Panels, Toolbars, Plugins

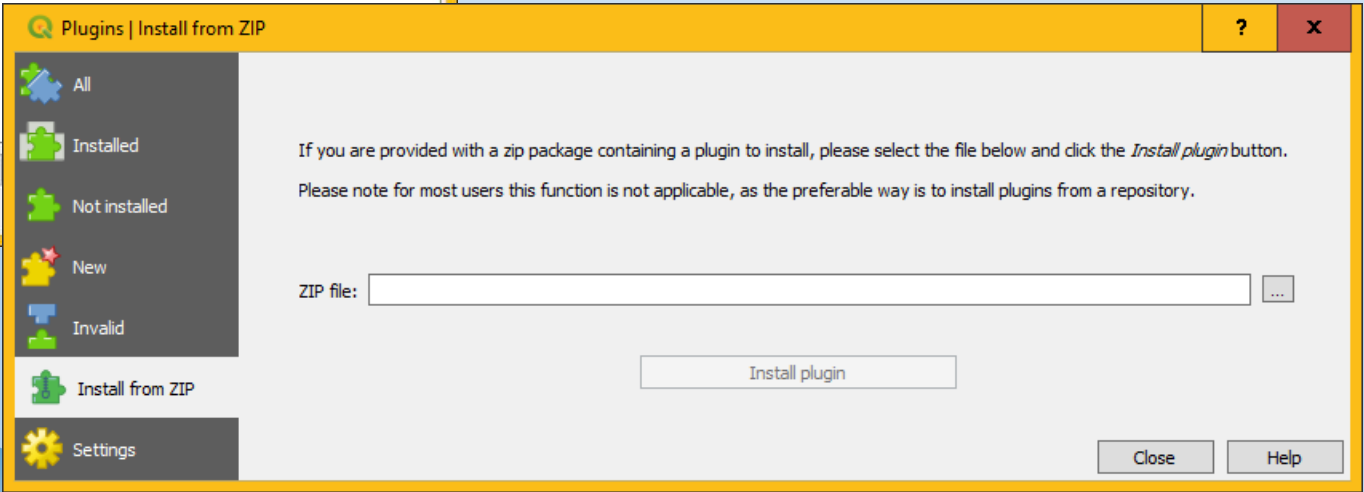
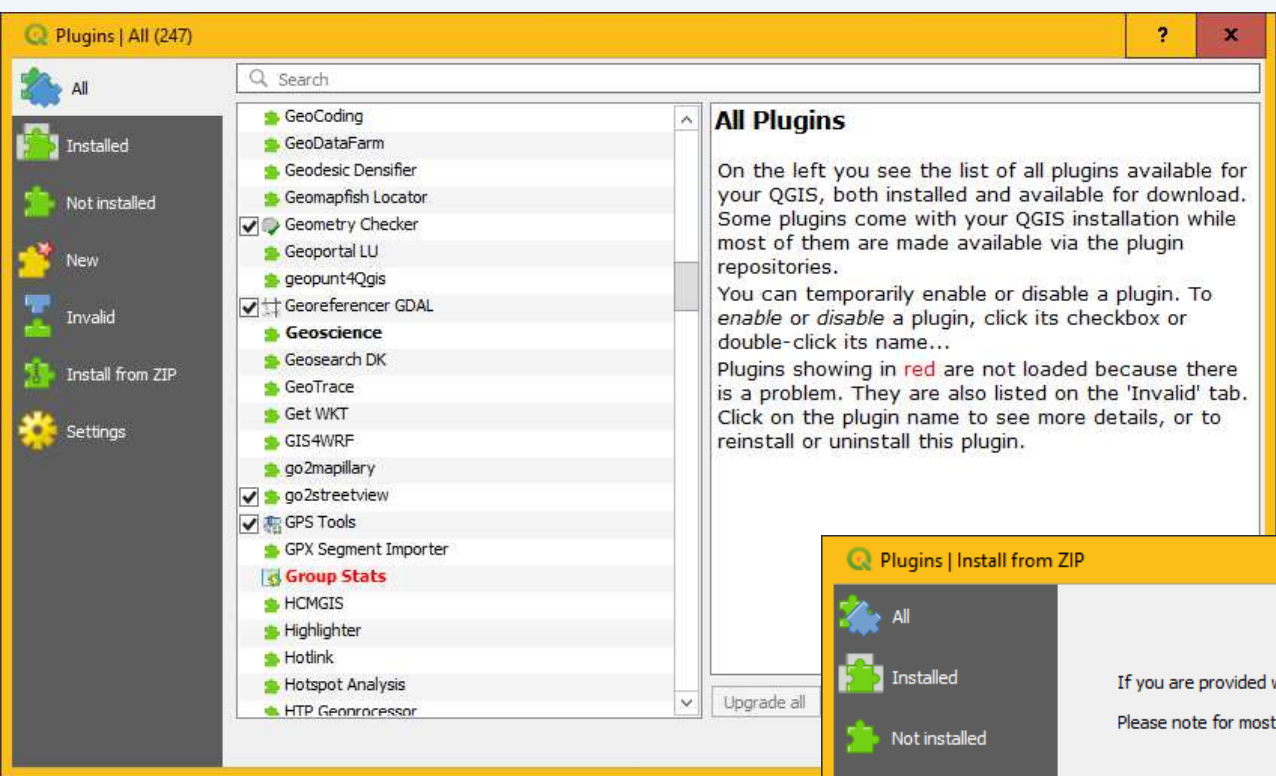


Useful Plugins to get you started (but they do not work with the latest version of QGIS! Use v. 2.18 instead):

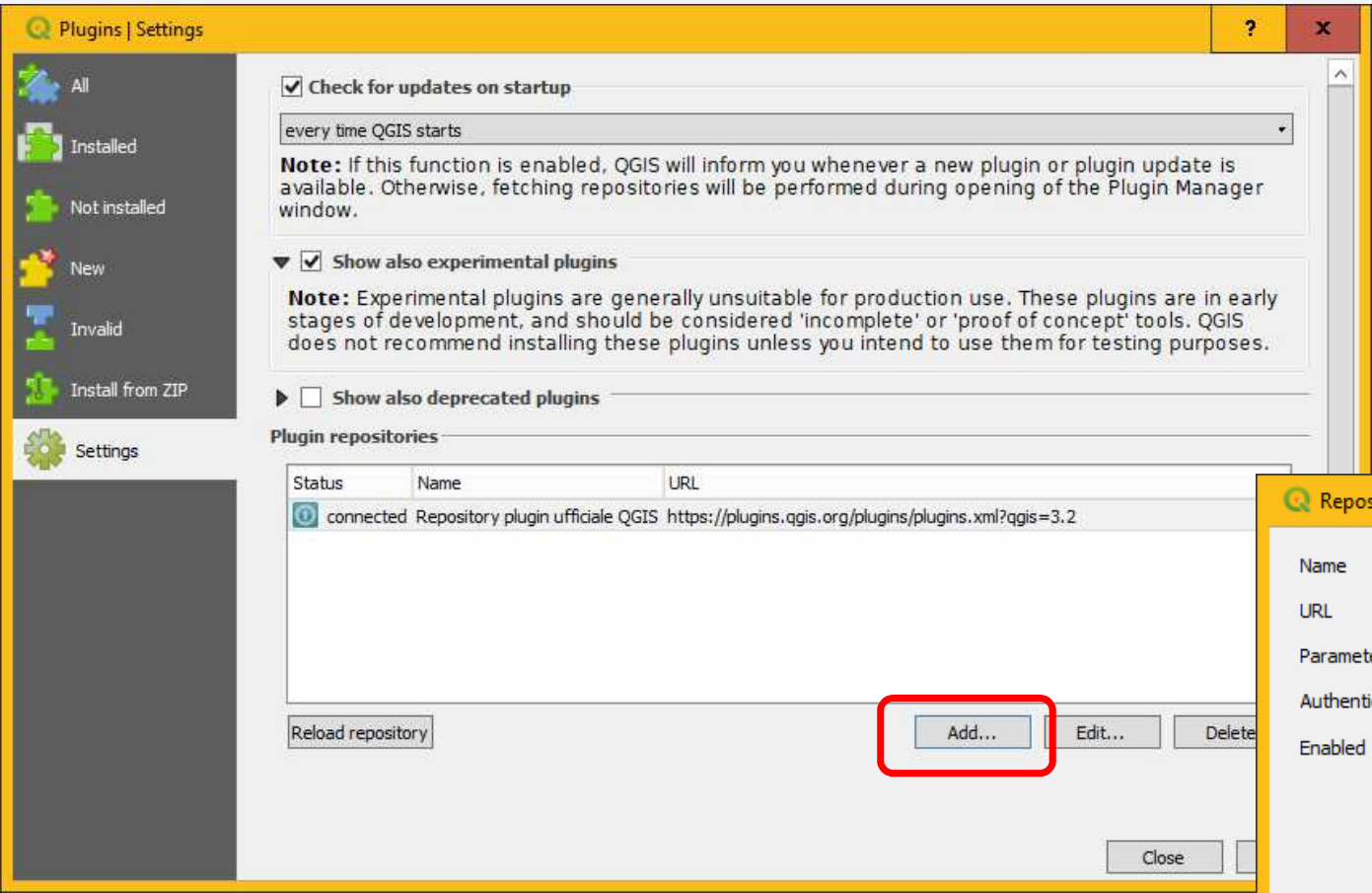
- **Group Stats** Plugin gives you the ability to summarize data layers in tabular format
- **OpenLayers** Plugin gives you access to open data layers to add as backdrops to your maps.

Examples include OpenstreetMap, Google Maps, Bing Maps and more.

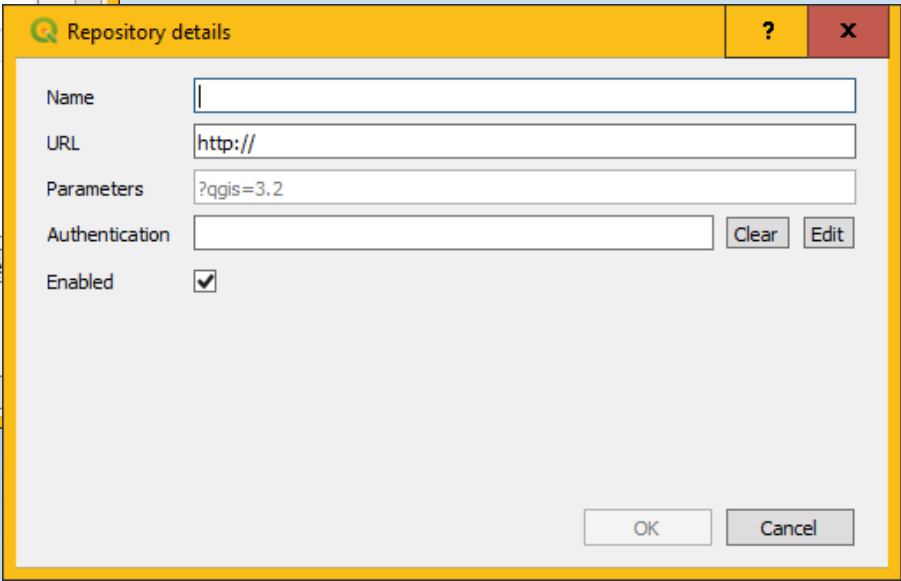
QGIS Project Configuration: Panels, Toolbars, Plugins



QGIS Project Configuration: Panels, Toolbars, Plugins



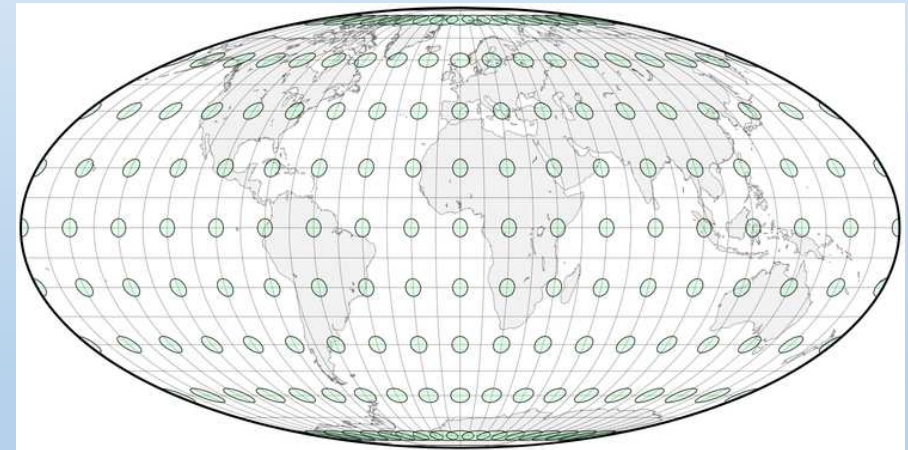
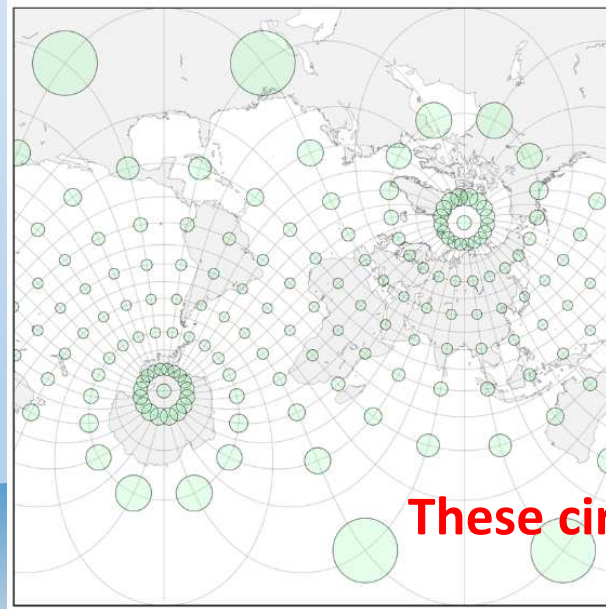
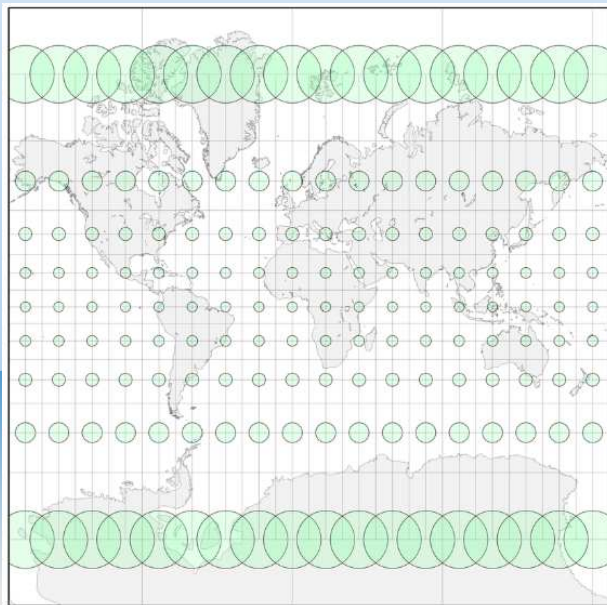
<https://plugins.qgis.org/plugins/>



QGIS Project Configuration: **Map Projections (SRS/CRS)**

Projections

- ☐ No one's favorite part of GIS
- ☐ But a necessary part of it nonetheless
- ☐ Convert points on the 3-dimensional Earth (**latitude** and **longitude**) to x and y coordinates on a 2-dimensional map

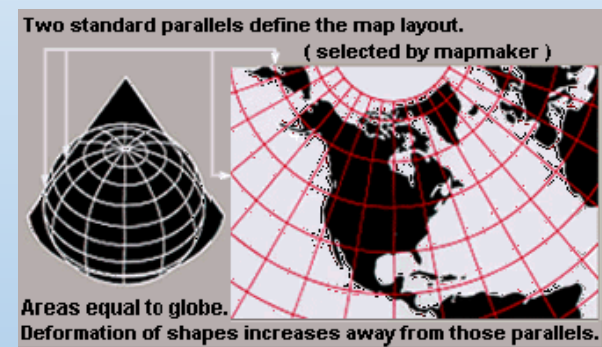


These circles are all the same size on the globe!

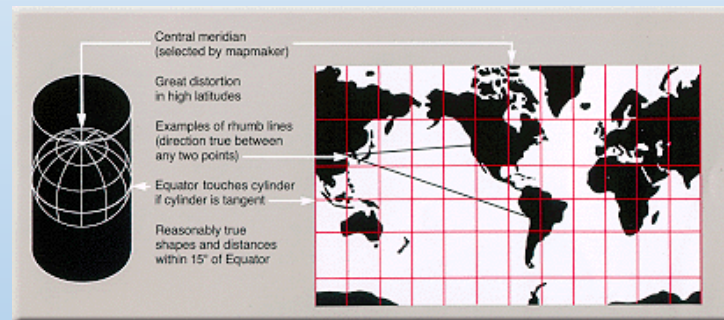
QGIS Project Configuration

A **spatial reference system (SRS)** or **coordinate reference system (CRS)** is a coordinate-based local, regional or global system used to locate geographical entities. A spatial reference system defines a specific map projection, as well as transformations between different spatial reference systems

Projected Coordinate systems: define locations on a flat model of the Earth



Albers projection



Mercator projection

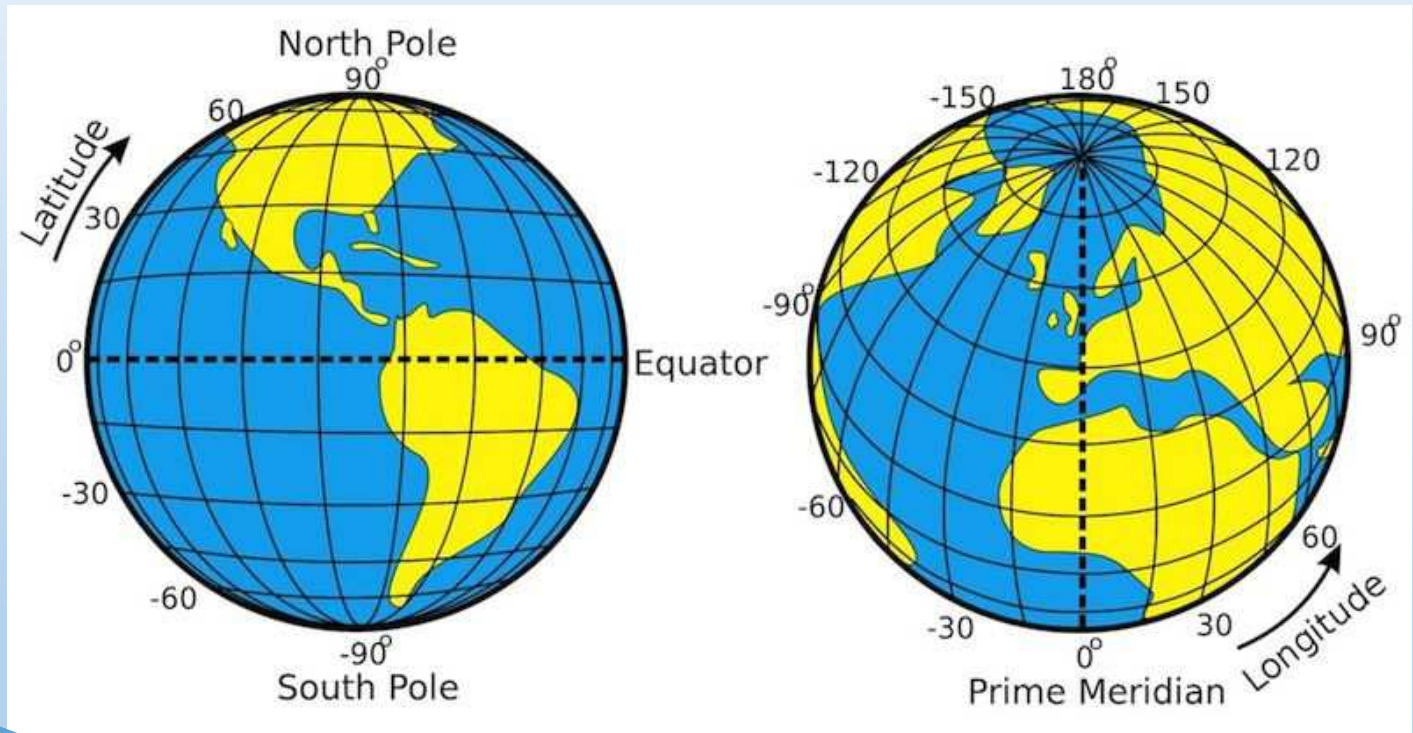


Geographic Coordinate systems:
define locations on a spherical model of the Earth

Project Configuration: CRS 1. Geographic Coordinate Systems:

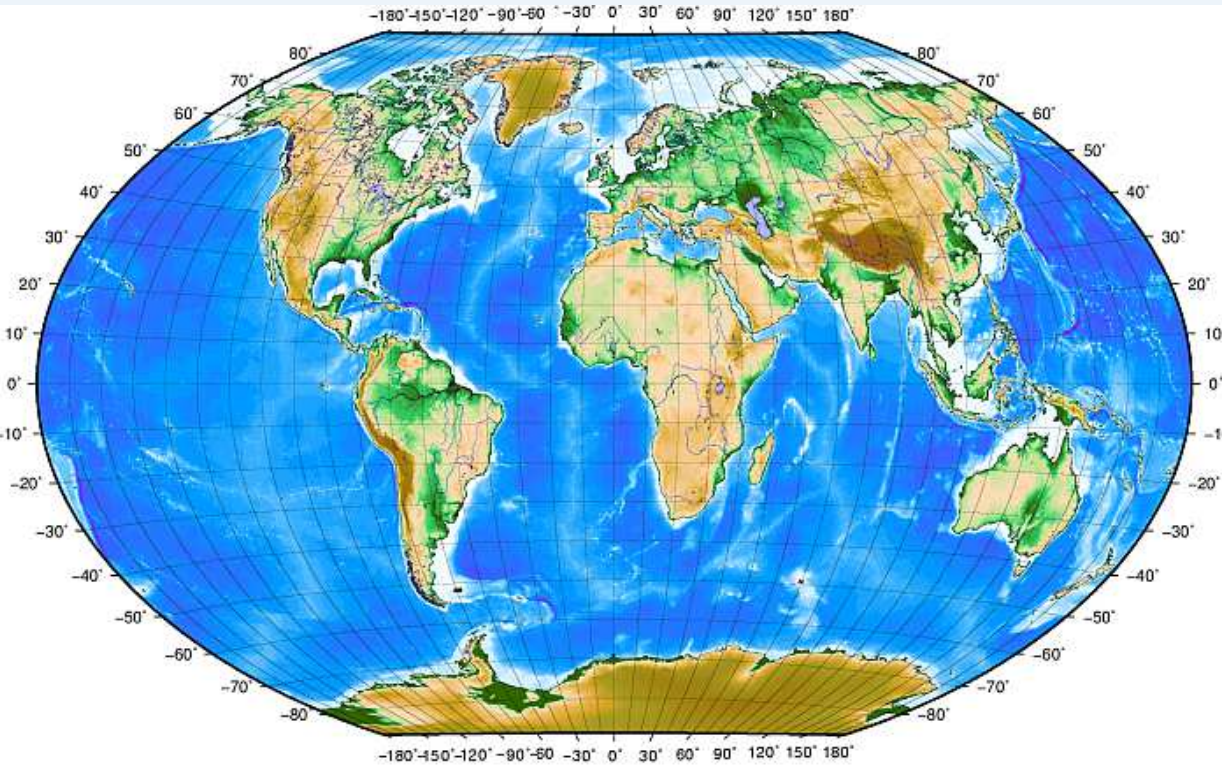
- Defines Locations with Latitude/Longitude values
- Latitude runs north and south of the **Equator** ($0^\circ - 90^\circ$ north and south)
- Longitude runs east and west of the **Prime Meridian** ($0^\circ - 180^\circ$)
- Prime Meridian is Greenwich

The **World Geodetic System** (WGS) is a standard for use in cartography, geodesy, and satellite navigation including GPS. It comprises a standard coordinate system for the Earth, a standard spheroidal reference surface (the datum or *reference ellipsoid*) for raw altitude data, and a gravitational equipotential surface (the *geoid*) that defines the nominal sea level.



The latest revision is **WGS 84** (also known as **WGS 1984, EPSG:4326**), established in 1984 and last revised in 2004. WGS 84 is the reference coordinate system used by the Global Positioning System.

Project Configuration: CRS 1. Geographic Coordinate Systems:



At the equator, and only at the equator, the distance represented by one line of longitude is equal to the distance represented by one degree of latitude. As you move towards the poles, the distance between lines of longitude becomes progressively less, until, at the exact location of the pole, all 360° of longitude are represented by a single point.

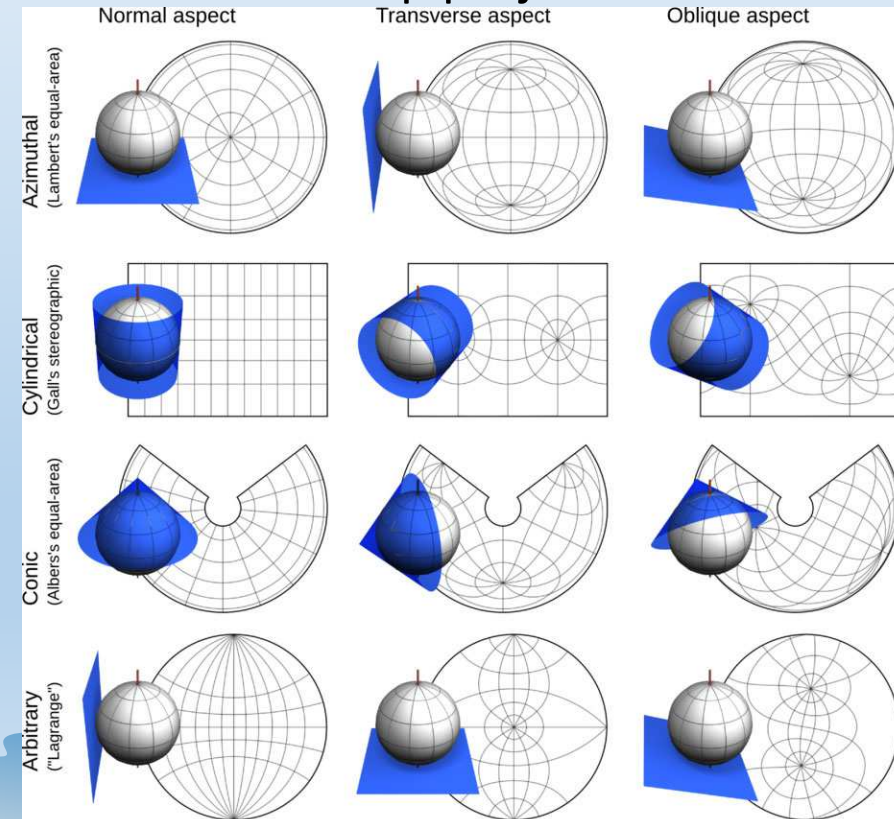
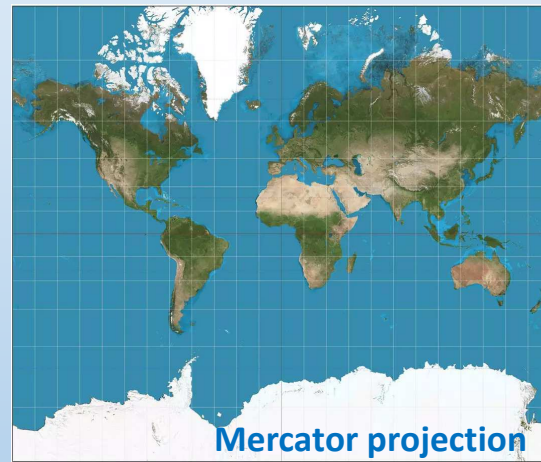
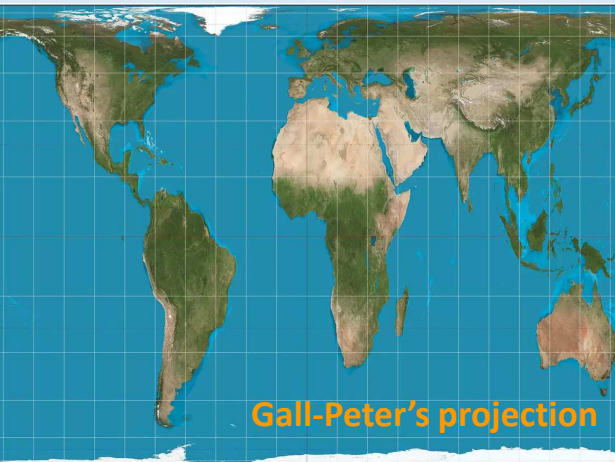
Using the geographic coordinate system, we have a grid of lines dividing the earth into squares that cover approximately 12363.365 Km² at the equator — a good start, but not very useful for determining the location of anything within that square. To be truly useful, a map grid must be divided into small enough sections so that they can be used to describe (with an acceptable level of accuracy) the location of a point on the map.

Project Configuration: CRS 2. Projected Coordinate Systems:

There are global map projections, but most map projections are created and optimized to project smaller areas of the earth's surface.

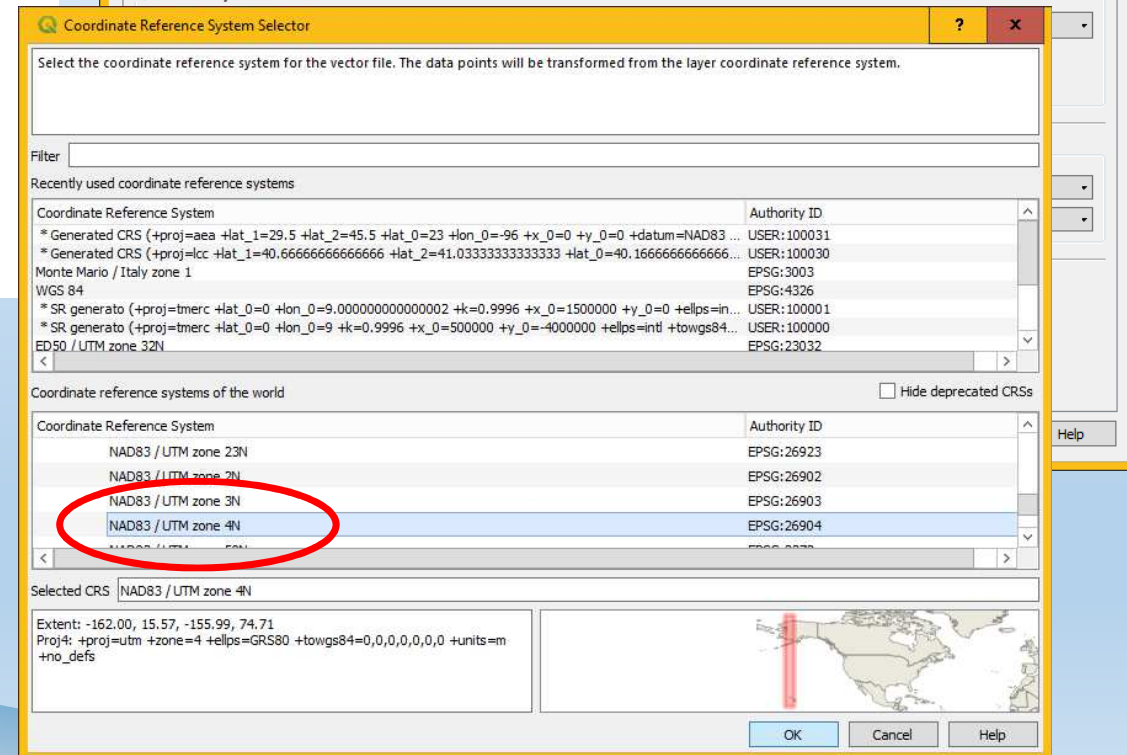
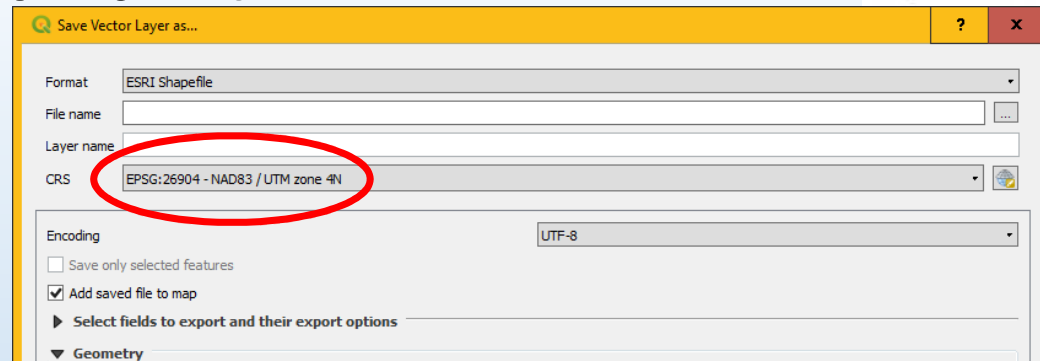
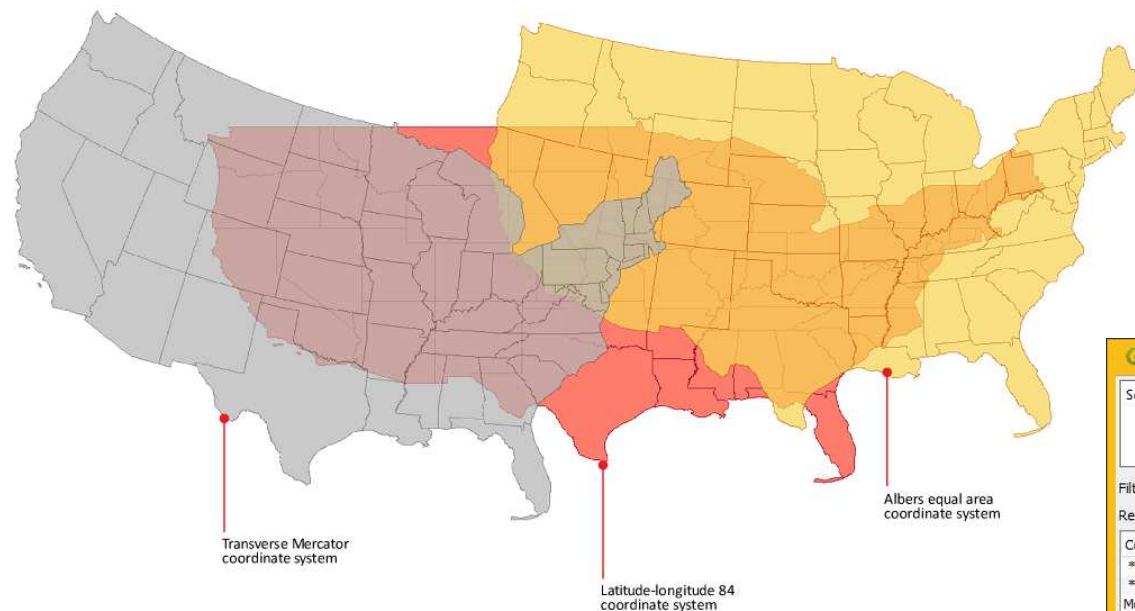
Map projections are never absolutely accurate representations of the spherical earth. They show distortions of **angular conformity**, **distance** and **area**.

It is impossible to preserve all these characteristics at the same time in a map projection.



Although the linear scale is equal in all directions around any point, thus preserving the angles and the shapes of small objects (making it a conformal map projection), the Mercator projection distorts the size of objects as the latitude increases from the Equator to the poles, where the scale becomes infinite.

How to change projection in QGIS (Reproject)



Layer > Save Vector Layer as > CRS