Data Preparation for PyAEZ

Pre-processing of the input data (weather, elevation, soils) for PyAEZ

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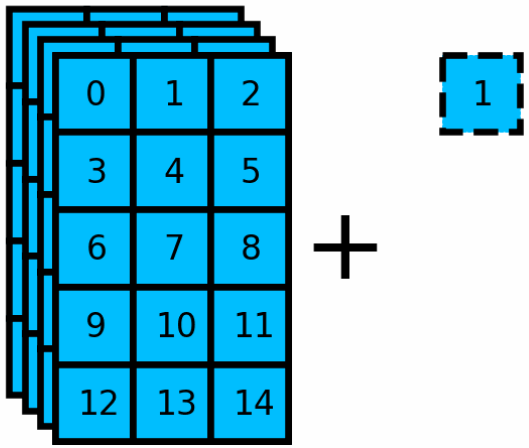


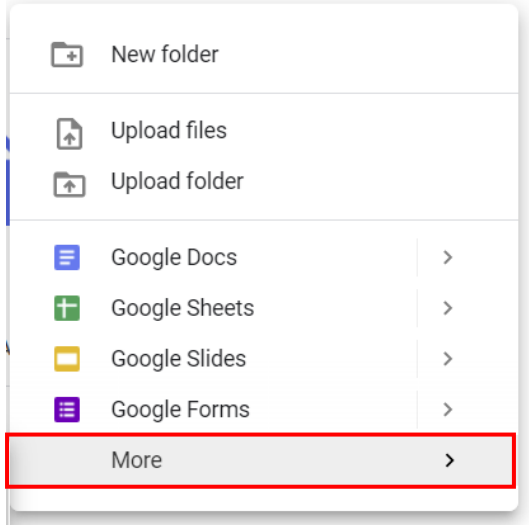
1. Converting Raster to NumPy file

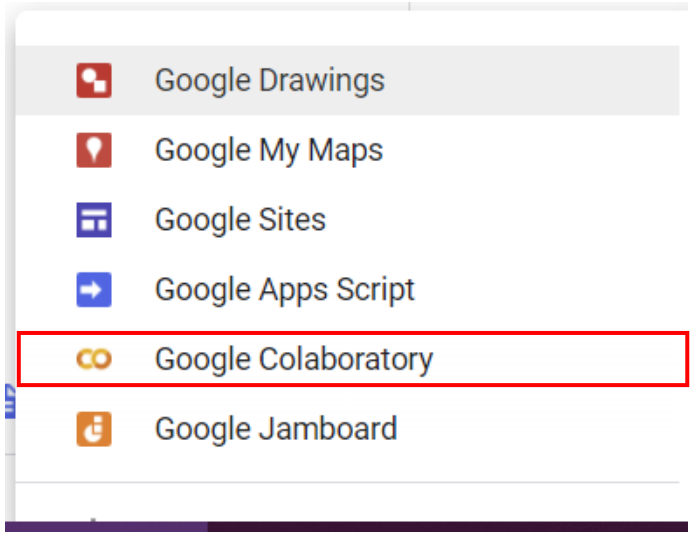
1. Converting Raster to NumPy file

➢Getting start with google Colab:

- Open Google drive, upload the file shared from Zoom to your Drive

- Go to your working directory and create new Google Colab notebook by right click and add new Google Collaboratory





1. Converting Raster to NumPy file

```
'''connecting to google drive'''

from google.colab import drive
drive.mount('/content/drive')
```

```
'''setting working directory'''

import os
os.chdir("drive/My Drive/your/directory")
```

```
'''import supporting libraries'''

import numpy as np
import matplotlib.pyplot as plt
import gdal
```

1. Converting Raster to NumPy

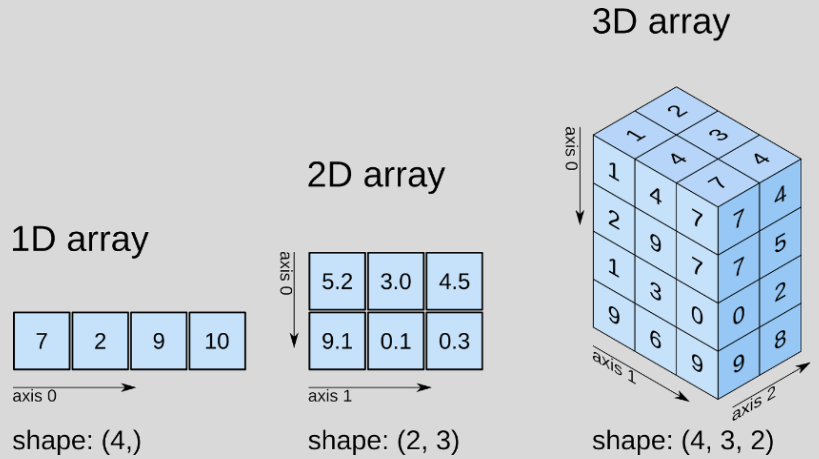
```
## Loading the Raster file and save it as Numpy format

im_width = 35
im_height = 40

## Create numpy array for storing data
min_temp = np.zeros((im_height, im_width, 12))


## Writing the loop to read monthly data and store in NumPy array
for i1 in range (1,13):
  min_temp[:,:,i1-1] = gdal.open('./climate/TempMin_'+str(i1)+'.tif').ReadAsArray()


## Save the NumPy array
np.save('./input/numpy_file/min_temp.npy', min_temp)
```



1. Converting Raster to NumPy file

```
## Practices Session

Load raster for other parameter and save as NumPy file(.npy)

• precipitation
• short_rad
• wind_speed
```

2. Cell alignment for Raster and Vector

2. Cell alignment for Raster and Vector

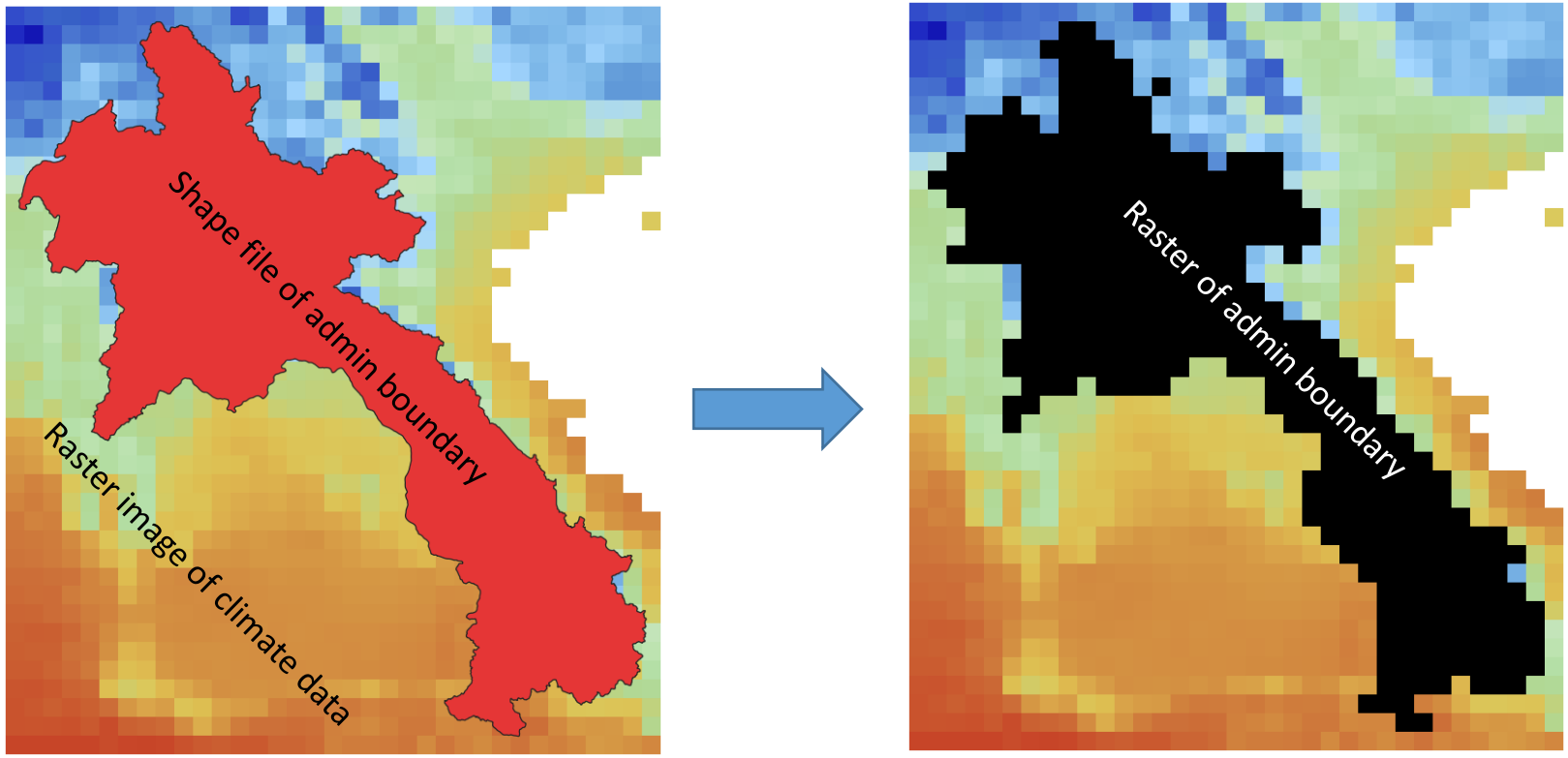
Raster files need to prepared with same width and heigh before input in the PyAEZ for simulation:

- Climate data: rainfall, temperature, solar radiation, wind speed, humidity
- Admin mask boundary
- Digital elevation model
- Soil and Slope map

Cell alignment for Raster and Vector

Admin mask boundary input:

- Shape file for the boundary, add new attribute for masking (admin_mask =1)
- Raster file with corrected width and height



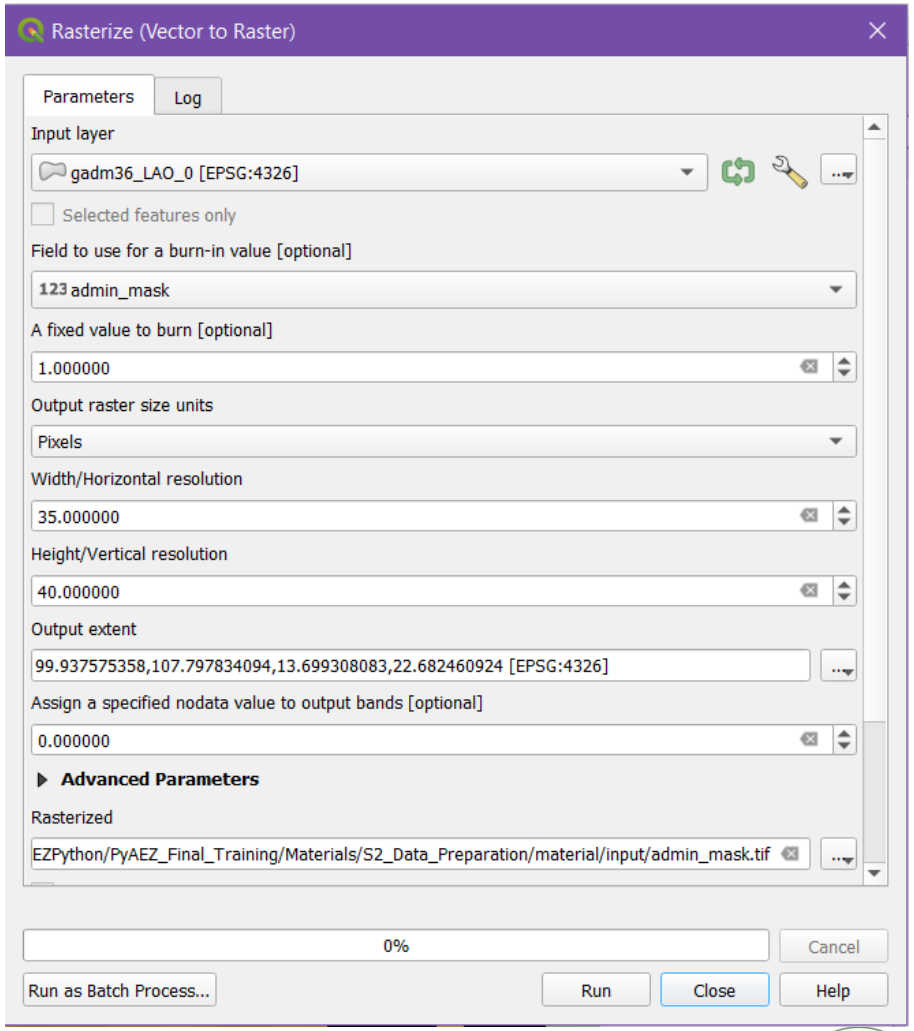
gadm36_LAO_0 — Features Total: 1, Filtered: 1, Selected: 0

	GID_0	NAME_0	admin_mask
1	LAO	Laos	1

CRS	EPSG:4326 - WGS 84 - Geographic
Extent	99.9375753582967548,13.6993080828227036 : 107.7978340943425621,22.6824609240179171
Unit	degrees
Width	35
Height	40
Data type	Float64 - Sixty four bit floating point
GDAL Driver Description	GTiff
GDAL Driver Metadata	GeoTIFF

Cell alignment for Raster and Vector

- **Rasterize (vector to Raster):**
  - Input layer: boundary shape file
  - Field for burn in value: 1
  - Output raster size: Pixels
  - Width: 35
  - Height: 40
  - Output extent: calculate from layer (corrected raster)
  - Rasterized: directory and name of the raster file

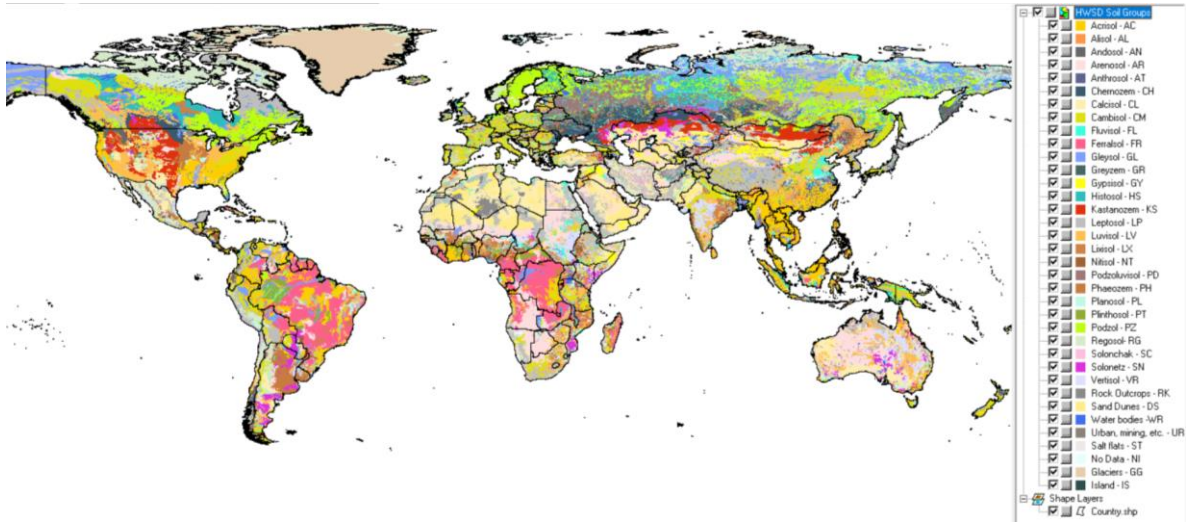


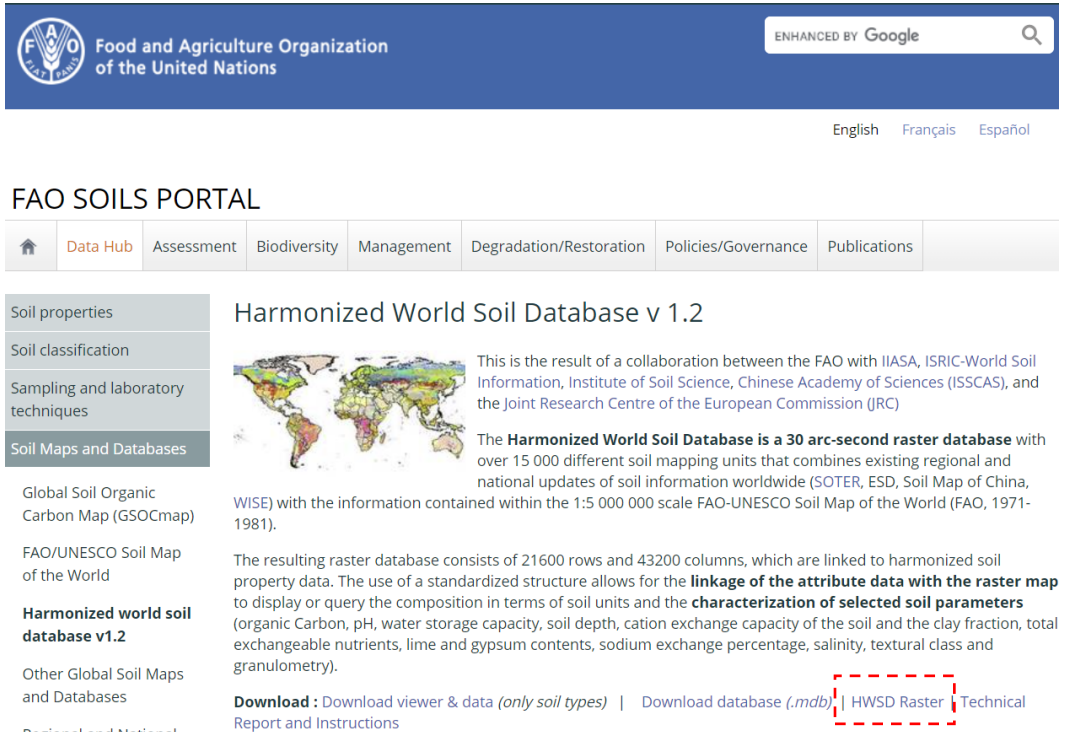
2. Harmonized Soil Data Base (HWSB) preparation

Harmonized Soil Data Base (HWSB)

Harmonized World Soil Database v 1.2:

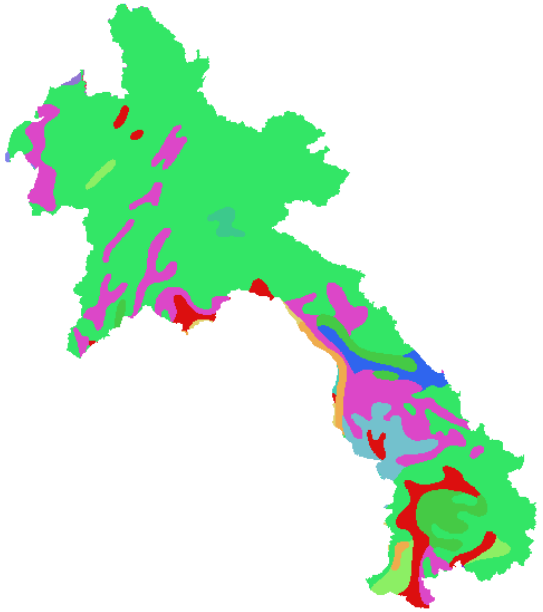
- 30 arc-second raster database
- Over 15 000 different soil mapping units
- Link for download: HWSD Raster





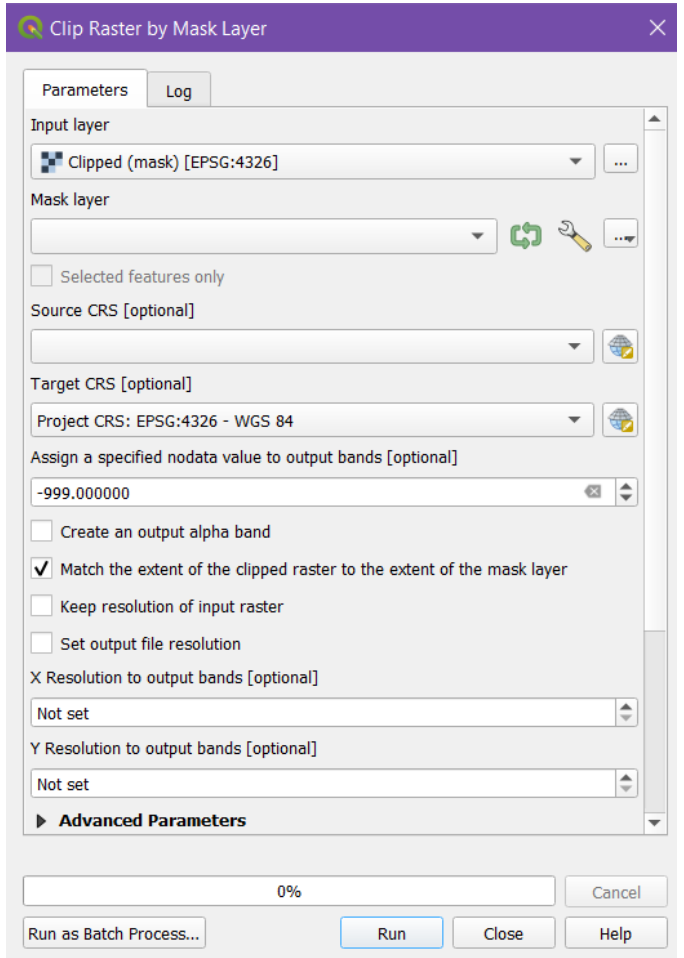
Harmonized Soil Data Base (HWSB)

- **Clip Raster by Mask Layer**
  - Input layer: world soil data
  - Target CRS: EPSG: 4326 – WGS 84
  - Assign no data value: -999
  - Save to temporary file



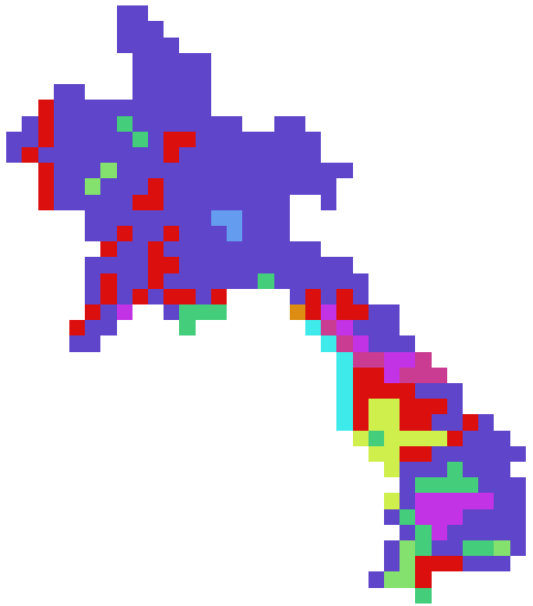
Information from provider

Name	Clipped (mask)
Path	C:\Users\Thaileng_GIC\AppData\Local\Temp\processing_GbghYM\4187bfd3df1e4440b50230d5770b6a6e\OUTPUT.tif
CRS	EPSG:4326 - WGS 84 - Geographic
Extent	100.0833333332933108,13.8999999999944421 : 107.6416666666236210,22.5083333333243338
Unit	degrees
Width	907
Height	1033
Data type	UInt16 - Sixteen bit unsigned integer
GDAL Driver Description	GTiff
GDAL Driver Metadata	GeoTIFF
Dataset Description	C:/Users/Thaileng_GIC/AppData/Local/Temp/processing_GbghYM/4187bfd3df1e4440b50230d5770b6a6e/OUTPUT.tif



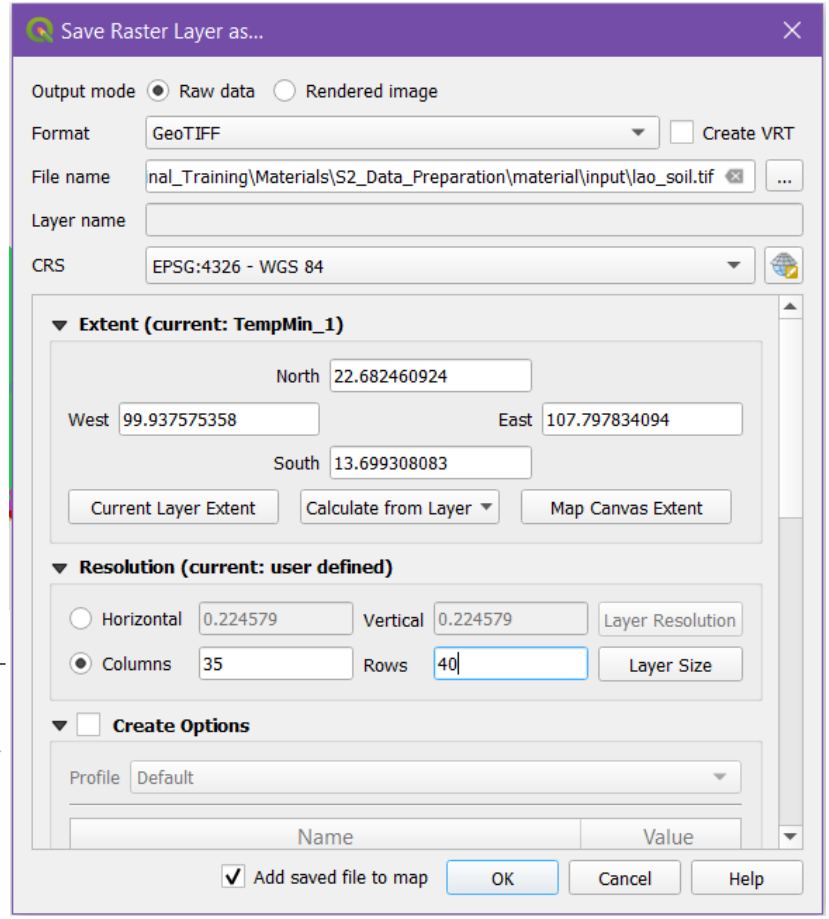
Harmonized Soil Data Base (HWSB)

- Export Raster (resampling):
  - Filename
  - Extent: Calculate from layer
  - Resolution: width and height



Information from provider

Name	lao_soil
Path	E:\My Drive\GoogleDrive\AEZPython\PyAEZ_Final_Training\Materials\S2_Data_Preparation\material\input\lao_soil.tif
CRS	EPSG:4326 - WGS 84 - Geographic
Extent	99.9375753580000037,13.6993080830000000 : 107.7978340939999953,22.6824609240000008
Unit	degrees
Width	35
Height	40
Data type	UInt16 - Sixteen bit unsigned integer
GDAL	GTiff



End