STANDARD OPERATING PROCEDURE

Title: Extracting DEM Data from NASA - ALOS PALSAR and Generating Contours for PV Case

Rev version: Rev.0			
Prepared by:		Santhosh Velan	2024/02/11
Reviewed & approved by:			
Issue date:			
Revision history			
[01]	[Date]		
[02]	[Date]		

SOP FOR STANDARD OPERATING PROCEDURE FOR EXTRACTING DEM DATA FROM NASA ALOS PALSAR AND GENERATING CONTOURS FOR PV CASE

1. OBJECTIVE:

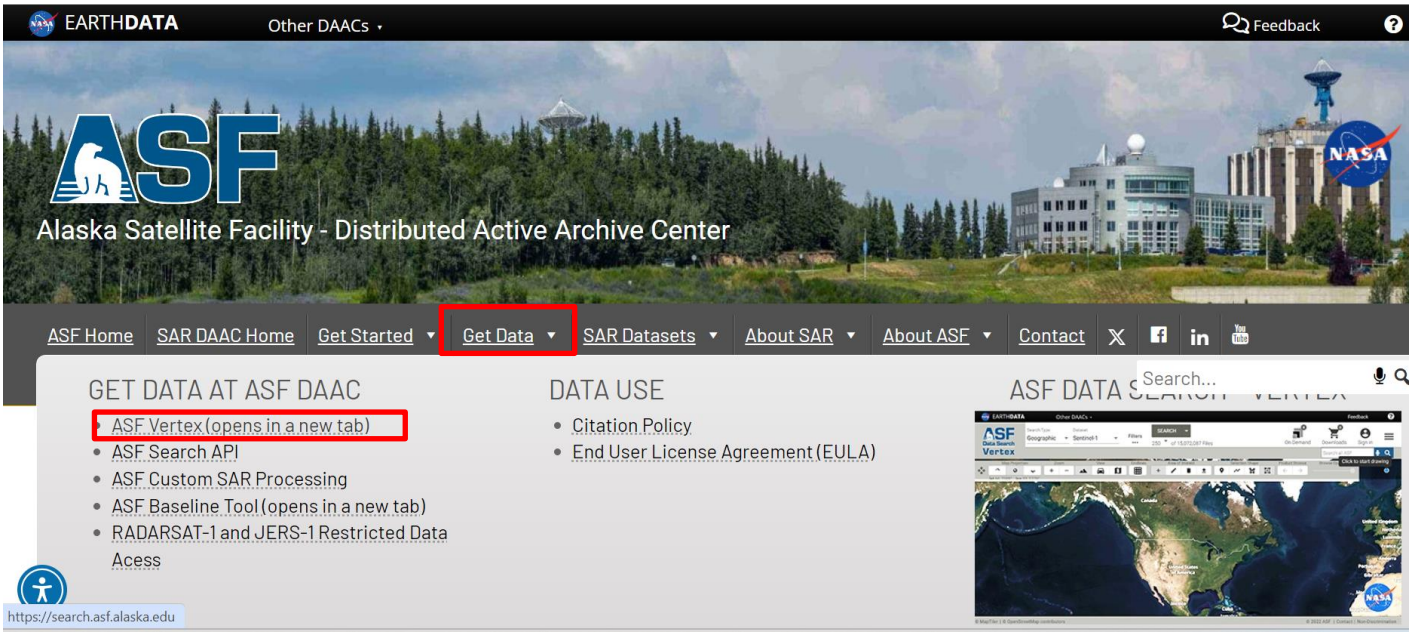
- THE OBJECTIVE OF THIS SOP IS TO PROVIDE A SYSTEMATIC GUIDE FOR EXTRACTING DIGITAL ELEVATION MODEL (DEM) DATA FROM NASA ALOS PALSAR AND GENERATING CONTOURS using QGIS FOR USE IN PVcase.

2. REQUIREMENTS:

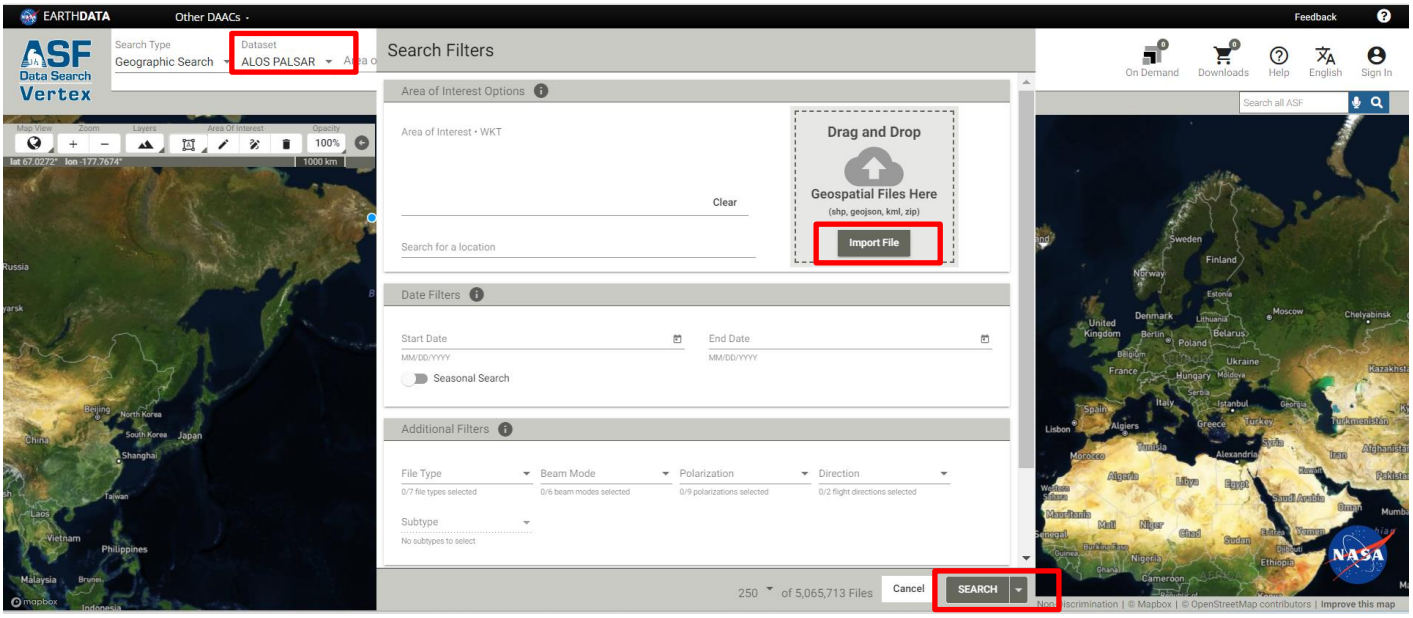
- ALOS PALSAR user account
- QGIS software
- PVcase

2. PROCEDURE:

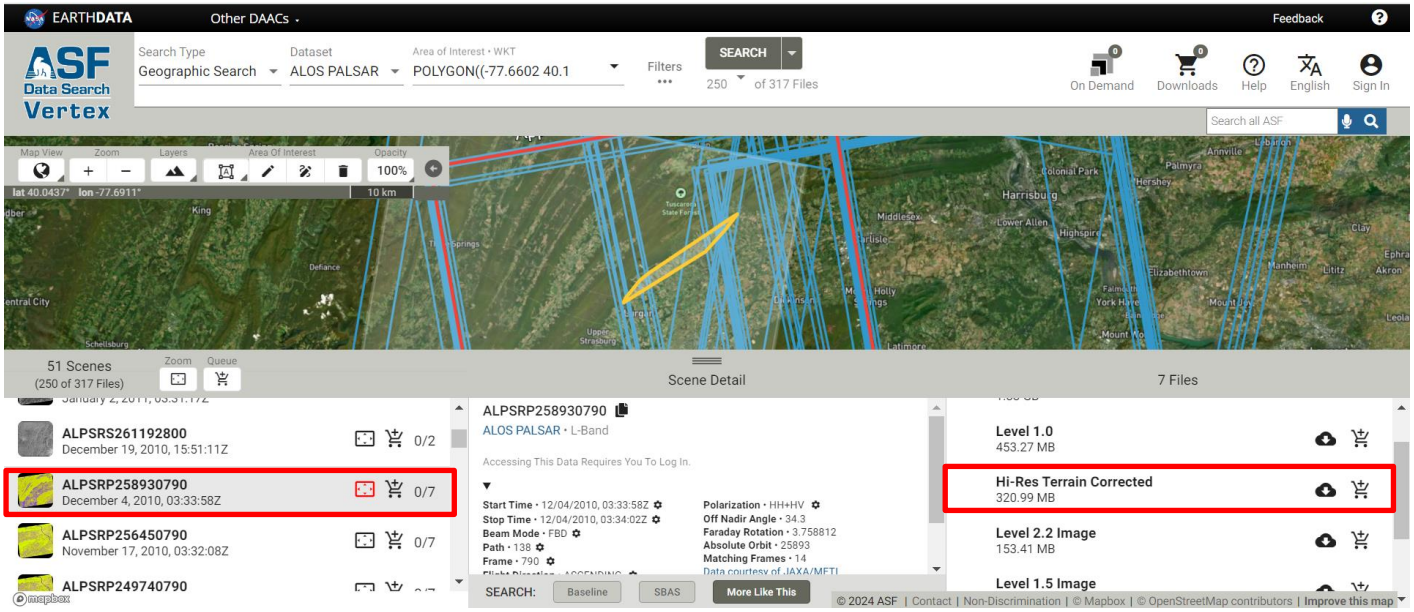
- **Step – 1: Click the link (ALOS PALSAR).**
- **Step – 2: From the screenshot shown below select Get Data → ASF VERTEX**



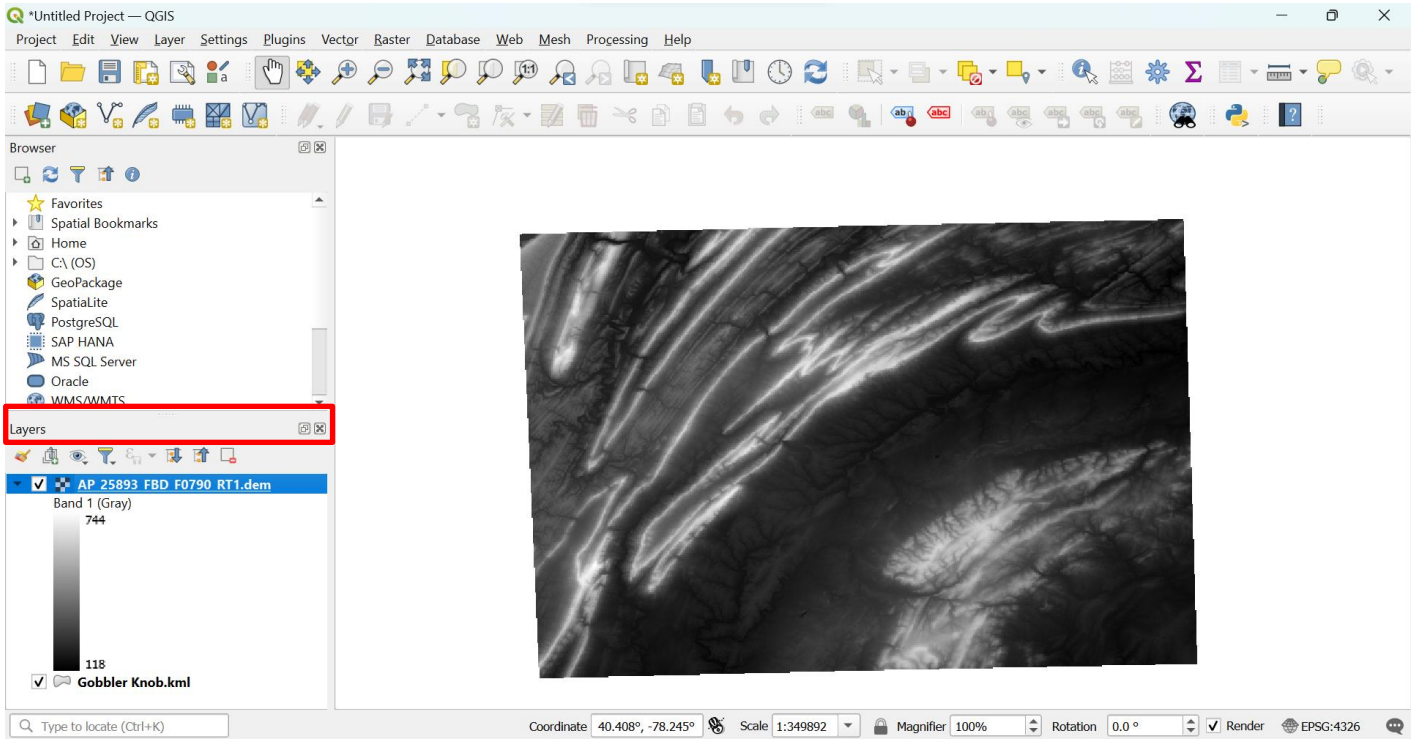
- **Step – 3: In the Search bar choose DATASET – ALOS PALSAR. Then click the Filters option and upload the (.kml) file. And, the hit SEARCH.**



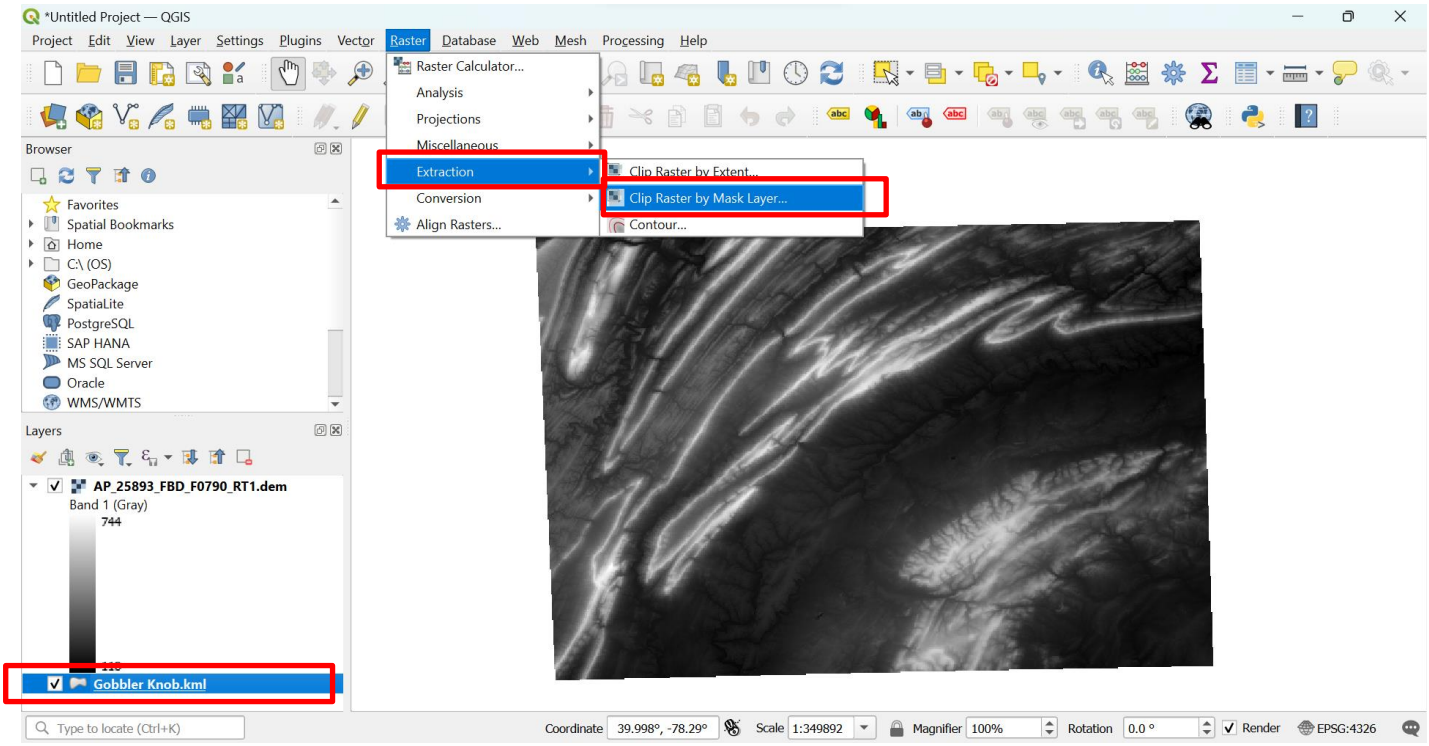
- Step – 4: A list of datasets available will be displayed on the bottom left corner of the page. Select the one with colored image and latest dataset to get better results. Once the file is selected click the download option next to the Hi-Res Terrain Corrected file.



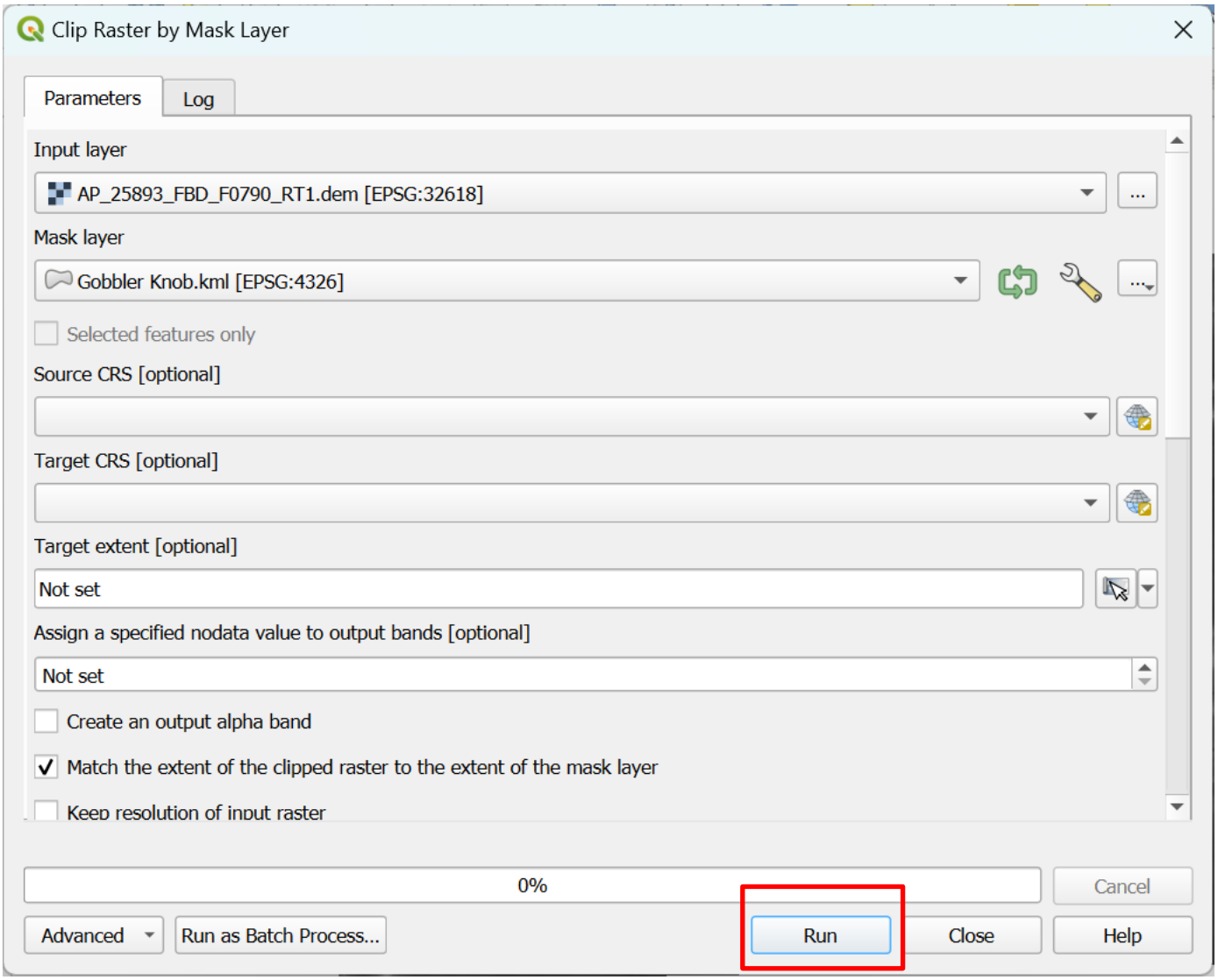
- Step – 5: Extract the file downloaded to get the .dem file.
- Step – 6: Open QGIS and import the .kmz and the .dem file by dragging the files and dropping in the Layers toolbar.



❖ Step – 7: Click on the .kmz and select Raster → Extraction → Clip Raster by Mask layer to clip the .dem file.

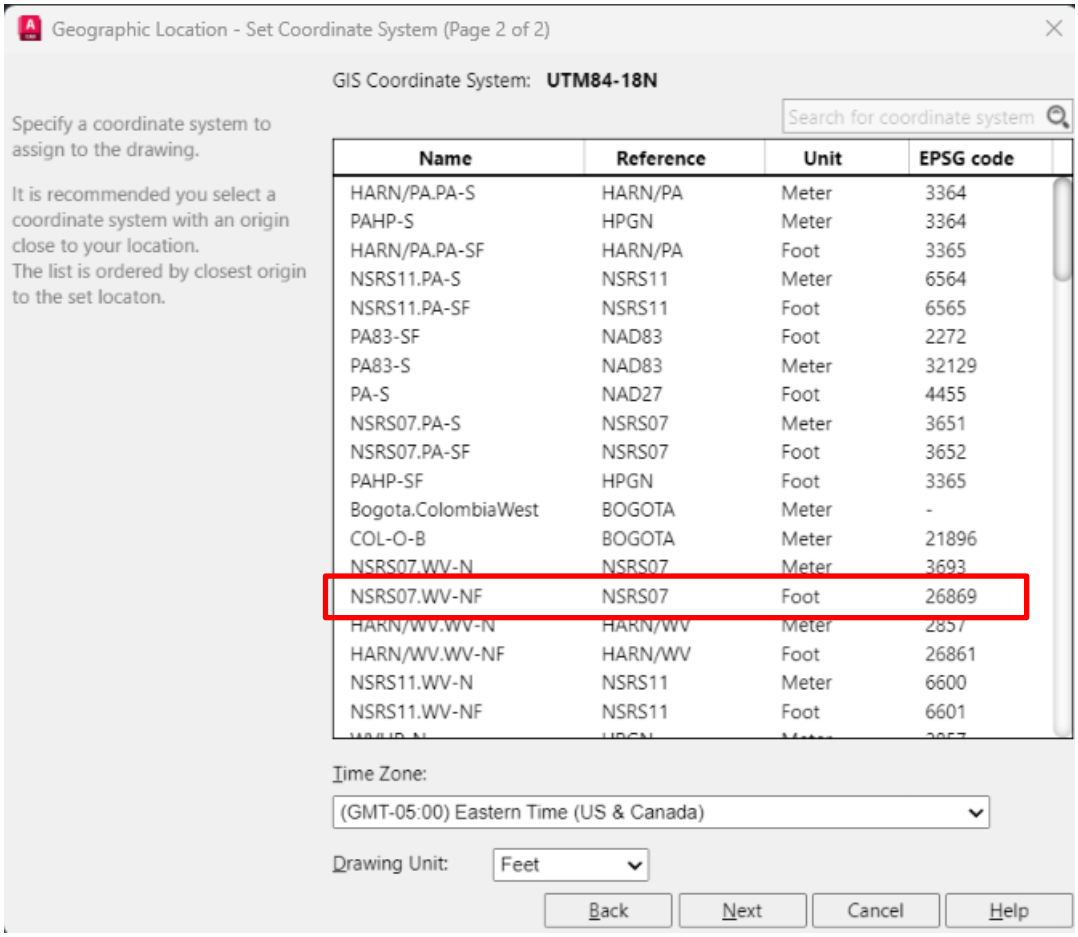


❖ Select the Input layer and Mask layer and click Run.

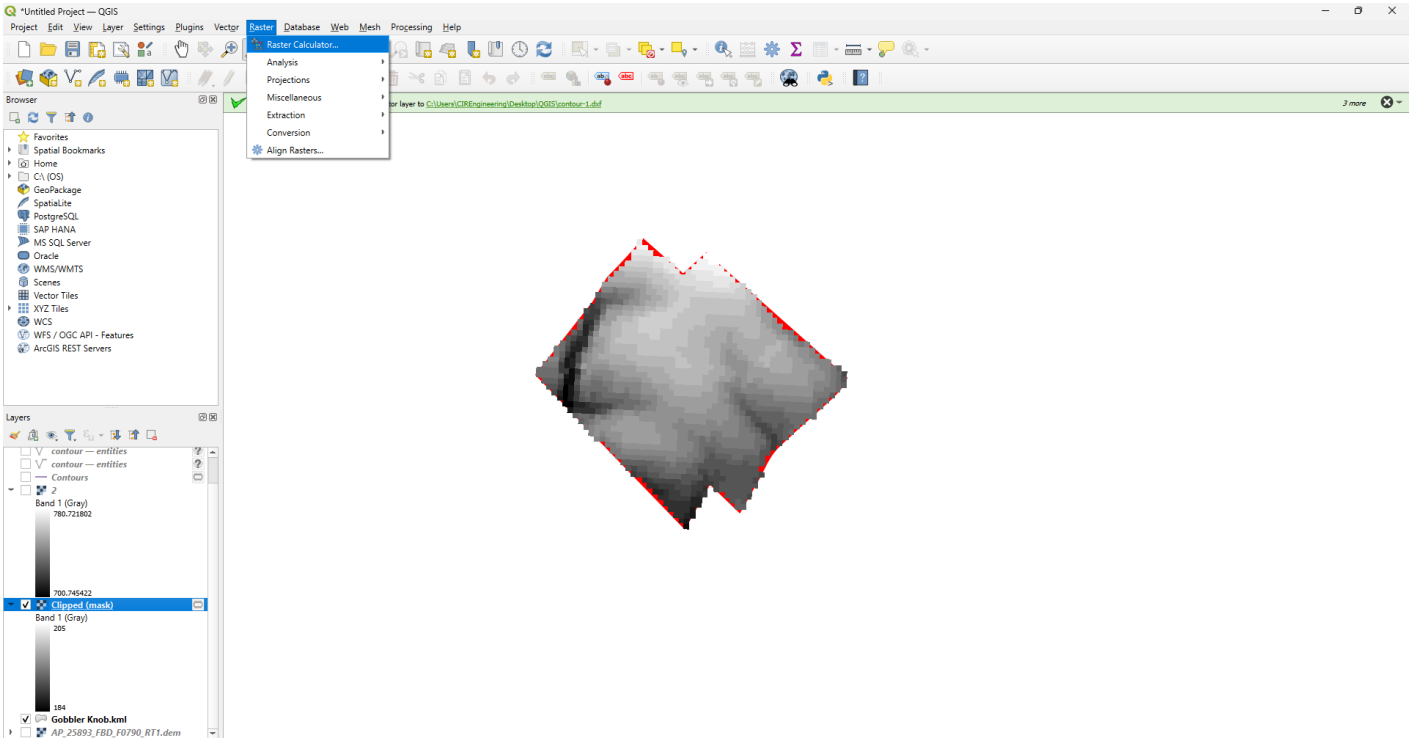


2. Geo-location:

- Step -1: In Autocad open the Geo-location and enter the Lat, Long and click Next.
- Step -2: As shown select the closest origin as displayed in the screenshot below and note down the EPSG code and ensure the Unit is in Foot.



- Step -3: Open QGIS and select the clipped mask and go to Raster→Raster Calculator.



- Step -4: Since the Google earth measuring unit is in Meter, multiply the clipped mask by 3.808399 and give the output folder location. Refer the below screenshot for reference.
- Step -5: Ensure the CRS shown in AutoCAD matches with the Output CRS in Raster Calculator and click OK. Refer the below screenshot for reference.

Raster Calculator

Raster Bands

2@1
AP_25893_FBD_F0790_RT1.dem@1
Clipped (mask)@1

Result Layer

Create on-the-fly raster instead of writing layer to disk

Output layer: geo-referenced

Output format: GeoTIFF

Spatial Extent

Use Selected Layer Extent

X min: 2522667.52224 X max: 2524955.54409

Y min: 619938.19004 Y max: 622050.75884

Resolution

Columns: 56 Rows: 52

Output CRS: EPSG:26869 - NAD83(NSRS2007) / West Vir

Add result to project

Operators

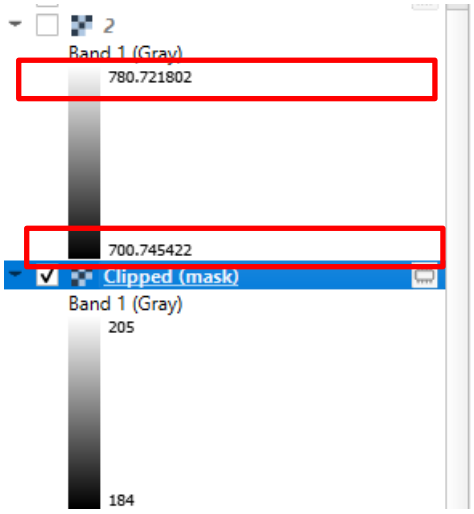
+	*	(	min	IF	cos	acos
-	/	)	max	AND	sin	asin
<	>	=	abs	OR	tan	atan
<=	>=	!=	^	sqrt	log10	ln

Raster Calculator Expression

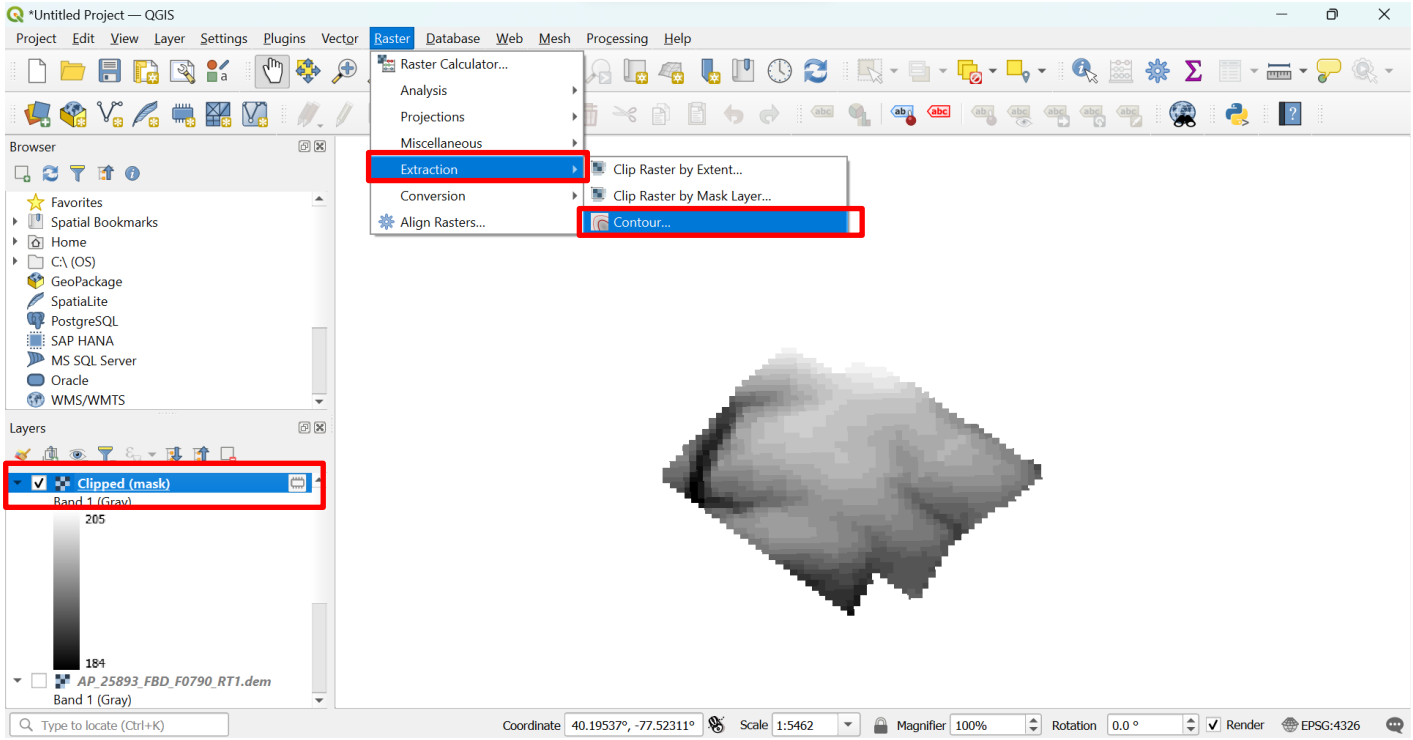
```
"Clipped (mask)@1" * 3.808399
```

OK Cancel Help

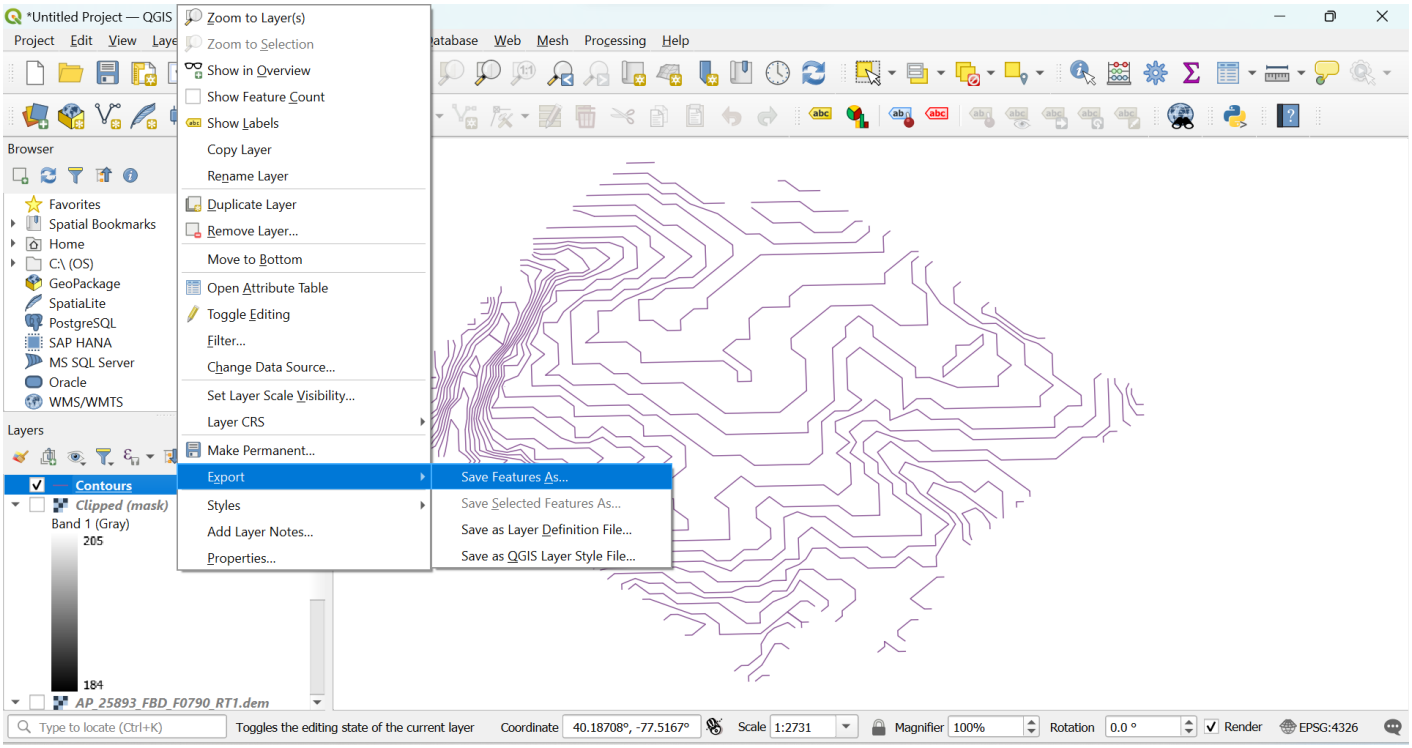
- Step -6: Ensure that the clipped area band is converted from meter to Feet.



- Step – 7: From the Clipped area to extract contour select Clipped area → Raster → Extraction → Contour and Run.



- Step – 8: Export the Contour data by using the command Export → Save Feature as → .DXF file



3. PVcase:

- Step -1: Open the AutoCAD and change the Units and DWG units to feet and set the location as per the one chosen for QGIS.
- Step -2: Open the .dxf file with contours and convert it into a block.
- Step -3: Open a new window and Import the KML file for boundary using import KML.
- Step -4: Copy the Contours and paste it in the window where the KML file is imported.