

Finding the EPSG Code and Projection Parameters for USGS lidar projects

The EPSG code is encoded into the header of the both Lidar Point Cloud (LPC) lidar .laz files and Original Product Resolution (OPR) DEM .tif files. **Many software packages can read the EPSG code directly out of the file header. If yours cannot, you may look them up yourself by following instructions below.**

If you also need the projection parameters, you can look them up once you know the EPSG code.

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Finding the EPSG Code (two methods)

Finding the EPSG Code using CSV file (WESM.csv)

- 1) Download the CSV metadata file from this location:
<https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/metadata/WESM.csv>
- 2) Open WESM.csv in any software you have that will open CSV files. The example in these instructions uses Microsoft Excel.
- 3) Locate the project name for your specific project.
The project name can be found in the file name of:

one of the **Lidar Point Cloud (LPC)** .laz files (for example: USGS_LPC_**MO_FEMANRCS_2020_D20**_15SWD56103605.laz) or

one of the **Original Product Resolution (OPR)** .tif files (for example: USGS_OPR_**MO_FEMANRCS_2020_D20**_15SWD56103605.tif)

The project name starts after USGS_LPC_ or USGS_OPR_ and ends before the unique alphanumeric tile ID and file extension. The project name for this example is highlighted in yellow in the above examples.

- 4) Look up the EPSG Code for your project.
You will find your project name under the attribute 'project' in **Column C**:

	A	B	C	D
1	workunit	workunit_id	project	project_id
1265	MO FEMA R7 South B1 2017	76418	MO FEMA R7 South 2017 D18	76421
1266	MO_FEMANRCS_2_2020	228061	MO_FEMANRCS_2020_D20	191887
1267	MO_FEMANRCS_3_2020	228064	MO_FEMANRCS_2020_D20	191887
1268	MO_FEMANRCS_1_2020	191884	MO_FEMANRCS_2020_D20	191887
1269	MO_NSEMO_1_2021	220532	MO_Northern_SEMO_2021_D21	220535

The 'horiz_crs' attribute in **Column K** will tell you the EPSG code for the Horizontal Coordinate Reference System (CRS).

The 'vert_crs' attribute in **Column L** will tell you the EPSG code for the Vertical Coordinate Reference System (CRS).

	K	L	geoic
1	horiz_crs	vert_crs	geoic
1265	6344	5703	GEOI
1266	6344	5703	GEOI
1267	6344	5703	GEOI
1268	6344	5703	GEOI
1269	6344	5703	GEOI

In this example, the EPSG Code for the Horizontal CRS is 6344, and the EPSG Code for the Vertical CRS is 5703.

If the EPSG Code(s) is all the information you need, there is no need to continue to the step for finding projection parameters.

If you find a case where there is more than one EPSG Code for the Horizontal CRS, please contact The National Map Help Desk for assistance. tnm_help@usgs.gov

Finding the EPSG Code using GIS software (WESM.gpkg)

- 1) Download the spatial metadata file from this location:
<https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/metadata/WESM.gpkg>
- 2) Open WESM.gpkg in any GIS software that will open CSV files. The example in these instructions uses ArcMap. Some examples of GIS software that will read .gpkg files are QGIS (free, open-Source), ArcMap, ArcPro, and Global Mapper.
- 3) Locate the project name for your specific project.
The project name can be found in the file name of:

one of the **Lidar Point Cloud (LPC)** .laz files (for example:
USGS_LPC_**MO_FEMANRCS_2020_D20**_15SWD56103605.laz) or

one of the **Original Product Resolution (OPR)** .tif files (for example:
USGS_OPR_**MO_FEMANRCS_2020_D20**_15SWD56103605.tif)

The project name starts after USGS_LPC_ or USGS_OPR_ and ends before the unique alphanumeric tile ID and file extension. The project name for this example is highlighted in yellow in the above examples.

- 4) Look up the EPSG Code for your project.
You will find your project name under the attribute 'project':

main.WESM_20230701					
	fid	geometry	workunit	workunit_id	project
	1860	Polygon	MO_FEMA_R7_South_B1_2017	76418	MO_FEMA_R7_South_2017_D18
	2575	Polygon	MO_FEMANRCS_2_2020	228061	MO_FEMANRCS_2020_D20
	2577	Polygon	MO_FEMANRCS_3_2020	228064	MO_FEMANRCS_2020_D20
	2583	Polygon	MO_FEMANRCS_1_2020	191884	MO_FEMANRCS_2020_D20
	2767	Polygon	MO_NSEMO_1_2021	220532	MO_Northern_SEMO_2021_D21

The 'horiz_crs' attribute will tell you the EPSG code for the Horizontal Coordinate Reference System (CRS).

The 'vert_crs' attribute in will tell you the EPSG code for the Vertical Coordinate Reference System (CRS).

horiz_crs	vert_crs
6344	5703
6344	5703
6344	5703
6344	5703
6344	5703

In this example, the EPSG Code for the Horizontal CRS is 6344, and the EPSG Code for the Vertical CRS is 5703.

If the EPSG Code(s) is all the information you need, there is no need to continue to the step for finding projection parameters.

If you find a case where there is more than one EPSG Code for the Horizontal CRS, please contact The National Map Help Desk for assistance. tnm_help@usgs.gov

Finding Projection Parameters using the EPSG code

You can find projection parameters for each EPSG code by looking on the <https://epsg.io/> website for your EPSC Code.

For this example,

Horizontal: <https://epsg.io/6344>

Vertical: <https://epsg.io/5703>

EPSG:6344

NAD83(2011) / UTM zone 15N

Attributes

Unit: metre

EPSG:5703

NAVD88 height

Attributes

Unit: metre

If you need specific parameters for your horizontal coordinate reference system, scroll to the bottom of the EPSG code website for you horizontal CRS projection parameters.

```
PROJECTION["Transverse_Mercator"],  
PARAMETER["latitude_of_origin",0],  
PARAMETER["central_meridian",-93],  
PARAMETER["scale_factor",0.9996],  
PARAMETER["false_easting",500000],  
PARAMETER["false_northing",0],  
UNIT["Meter",1],  
AUTHORITY["epsg","6344"]]
```

You can always email tnm_help@usgs.gov for help in locating projection parameters for lidar projects.