ENTREGA 2 - Parte A

Sistemas de Información Geográfica Avanzado

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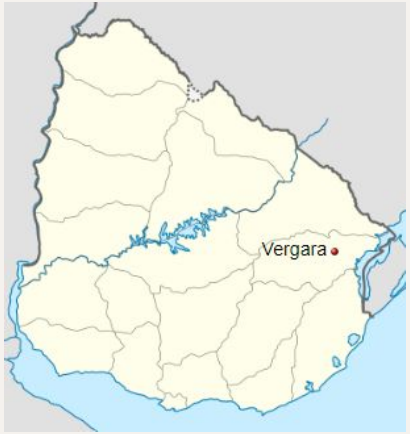
Objetivos

- ➔ Trabajar con archivos LAS y LAZ, y explorar sus distintas formas de visualización.
- ➔ Crear un Modelo Digital de Elevación a partir de la nube de puntos.
- ➔ A partir del Modelo Digital de Terreno, obtener diferentes subproductos.

Zona de trabajo

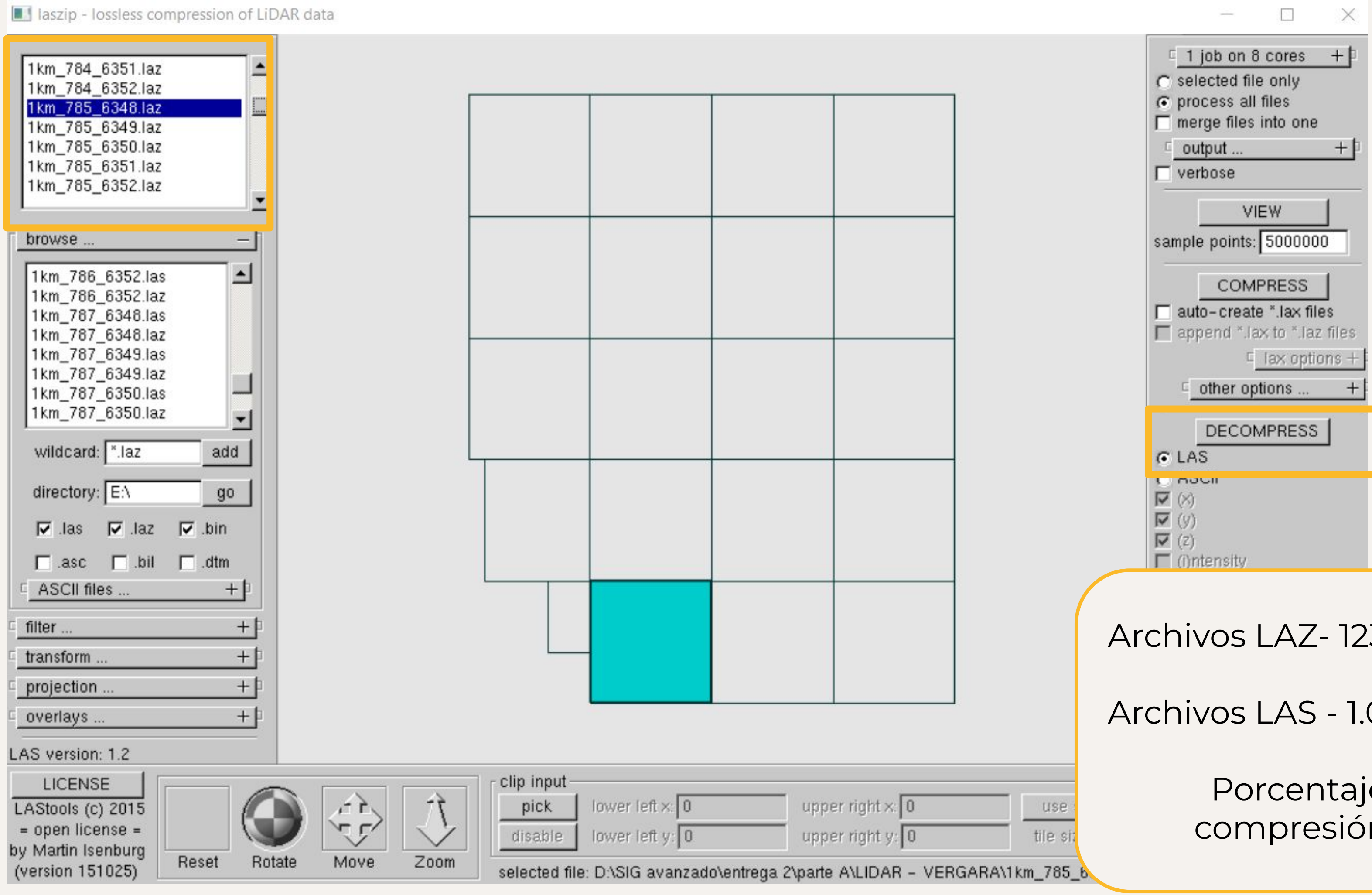
Vergara - Treinta y Tres



Fuente: wikipedia

Sistema de referencia

EPSG: 32721 WGS84 UTM 21S


laszip - lossless compression of LiDAR data
browse ...
add
go
ASCII files ...
filter ...
transform ...
projection ...
overlays ...
LICENSE
Reset
Rotate
Move
Zoom
clip input
pick
disable
VIEW
COMPRESS
lax options
other options ...
DECOMPRESS
output ...

1km_784_6351.laz
1km_784_6352.laz
1km_785_6348.laz
1km_785_6349.laz
1km_785_6350.laz
1km_785_6351.laz
1km_785_6352.laz

1km_786_6352.las
1km_786_6352.laz
1km_787_6348.las
1km_787_6348.laz
1km_787_6349.las
1km_787_6349.laz
1km_787_6350.las
1km_787_6350.laz

wildcard: *.laz

directory: E:\

☑ .las ☑ .laz ☑ .bin

☐ .asc ☐ .bil ☐ .dtm

LAS version: 1.2

LAStools (c) 2015
= open license =
by Martin Isenburg
(version 151025)

1 job on 8 cores

○ selected file only
● process all files
☐ merge files into one
☐ verbose

sample points: 5000000

☐ auto-create *.lax files
☐ append *.lax to *.laz files

● LAS
○ ASCII
☑ (x)
☑ (y)
☑ (z)
☐ (i)ntensity

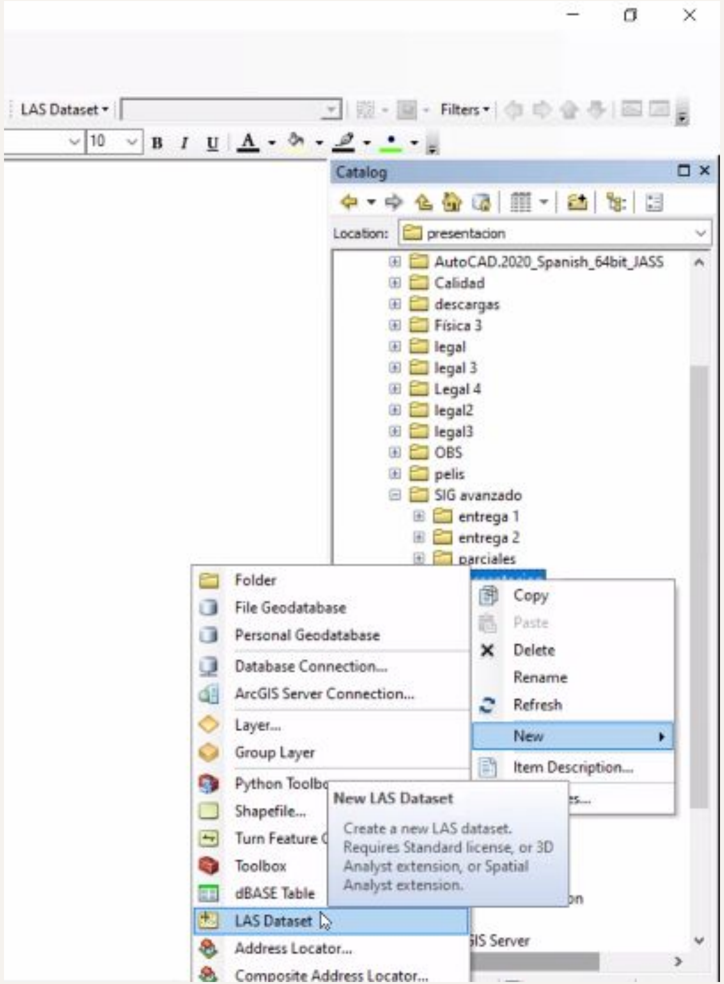
lower left x: 0
lower left y: 0
upper right x: 0
upper right y: 0

selected file: D:\SIG avanzado\entrega 2\parte A\LIDAR - VERGARA\1km_785_6

Archivos LAZ- 123 MB

Archivos LAS - 1.08 GB

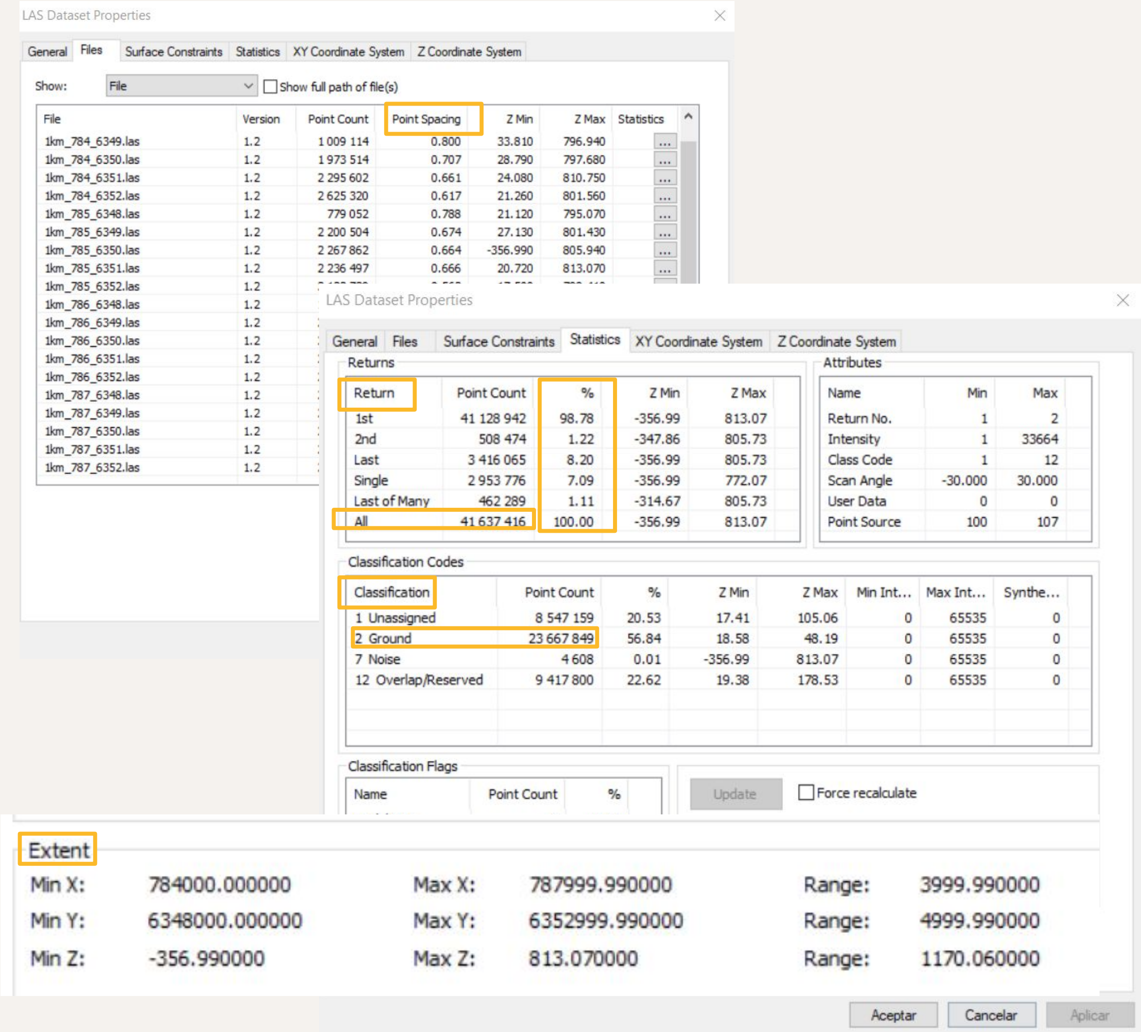
Porcentaje de compresión: 11%


LAS Dataset
Filters
Catalog
AutoCAD.2020_Spanish_64bit_JASS
Calidad
descargas
Física 3
legal
legal 3
Legal 4
legal2
legal3
OBS
pelis
SIG avanzado
entrega 1
entrega 2
parciales
Folder
File Geodatabase
Personal Geodatabase
Database Connection...
ArcGIS Server Connection...
Layer...
Group Layer
Python Toolbo
Shapefile...
Turn Feature C
Toolbox
dBASE Table
LAS Dataset
Address Locator...
Composite Address Locator...
Copy
Paste
Delete
Rename
Refresh
New
Item Description...

Location: presentacion

New LAS Dataset

Create a new LAS dataset. Requires Standard license, or 3D Analyst extension, or Spatial Analyst extension.


LAS Dataset Properties
General
Files
Surface Constraints
Statistics
XY Coordinate System
Z Coordinate System

Show: File ☐ Show full path of file(s)

File	Version	Point Count	Point Spacing	Z Min	Z Max	Statistics
1km_784_6349.las	1.2	1 009 114	0.800	33.810	796.940	...
1km_784_6350.las	1.2	1 973 514	0.707	28.790	797.680	...
1km_784_6351.las	1.2	2 295 602	0.661	24.080	810.750	...
1km_784_6352.las	1.2	2 625 320	0.617	21.260	801.560	...
1km_785_6348.las	1.2	779 052	0.788	21.120	795.070	...
1km_785_6349.las	1.2	2 200 504	0.674	27.130	801.430	...
1km_785_6350.las	1.2	2 267 862	0.664	-356.990	805.940	...
1km_785_6351.las	1.2	2 236 497	0.666	20.720	813.070	...
1km_785_6352.las	1.2					
1km_786_6348.las	1.2					
1km_786_6349.las	1.2					
1km_786_6350.las	1.2					
1km_786_6351.las	1.2					
1km_786_6352.las	1.2					
1km_787_6348.las	1.2					
1km_787_6349.las	1.2					
1km_787_6350.las	1.2					
1km_787_6351.las	1.2					
1km_787_6352.las	1.2					

Returns

Return	Point Count	%	Z Min	Z Max
1st	41 128 942	98.78	-356.99	813.07
2nd	508 474	1.22	-347.86	805.73
Last	3 416 065	8.20	-356.99	805.73
Single	2 953 776	7.09	-356.99	772.07
Last of Many	462 289	1.11	-314.67	805.73
All	41 637 416	100.00	-356.99	813.07

Attributes

Name	Min	Max
Return No.	1	2
Intensity	1	33664
Class Code	1	12
Scan Angle	-30.000	30.000
User Data	0	0
Point Source	100	107

Classification Codes

Classification	Point Count	%	Z Min	Z Max	Min Int...	Max Int...	Synthe...
1 Unassigned	8 547 159	20.53	17.41	105.06	0	65535	0
2 Ground	23 667 849	56.84	18.58	48.19	0	65535	0
7 Noise	4 608	0.01	-356.99	813.07	0	65535	0
12 Overlap/Reserved	9 417 800	22.62	19.38	178.53	0	65535	0

Classification Flags

Name	Point Count	%

☐ Force recalculate

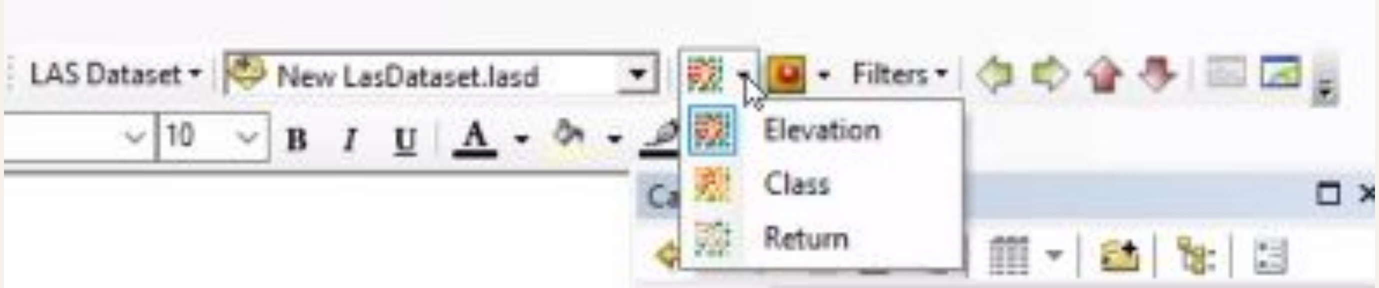
Extent

Min X:	784000.000000	Max X:	787999.990000	Range:	3999.990000
Min Y:	6348000.000000	Max Y:	6352999.990000	Range:	4999.990000
Min Z:	-356.990000	Max Z:	813.070000	Range:	1170.060000

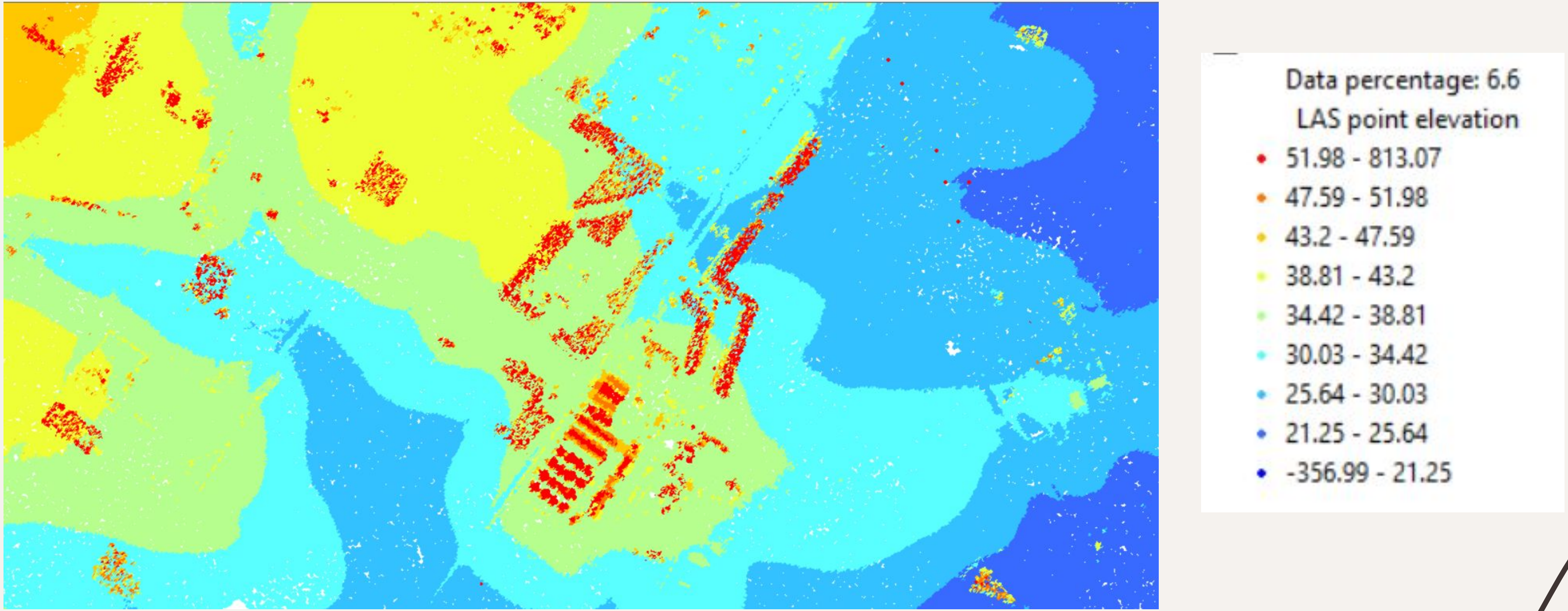
Aceptar
Cancelar
Aplicar

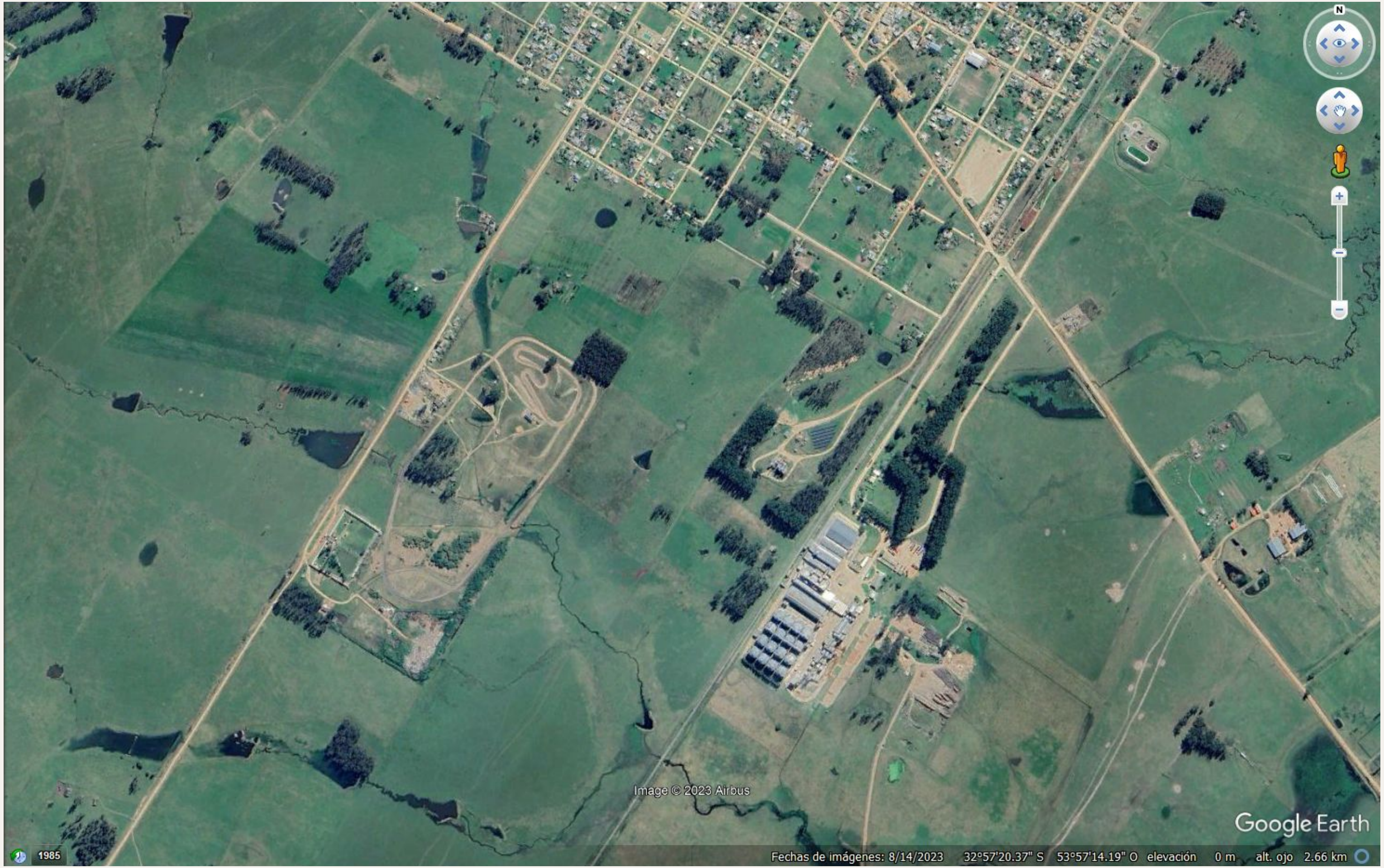
- **Cantidad total de puntos de la nube masiva:** 41.637.416
- **Extensión**: 3999.99 m x 4999.99 m
- **Separación media:** 0.68 m
- **4 Categorías:** Sin asignar, Terreno, Ruido, Superposición.
- **Cantidad de puntos “GROUND” (terreno):** 23.667.849

Distintas formas de visualización del LAS:

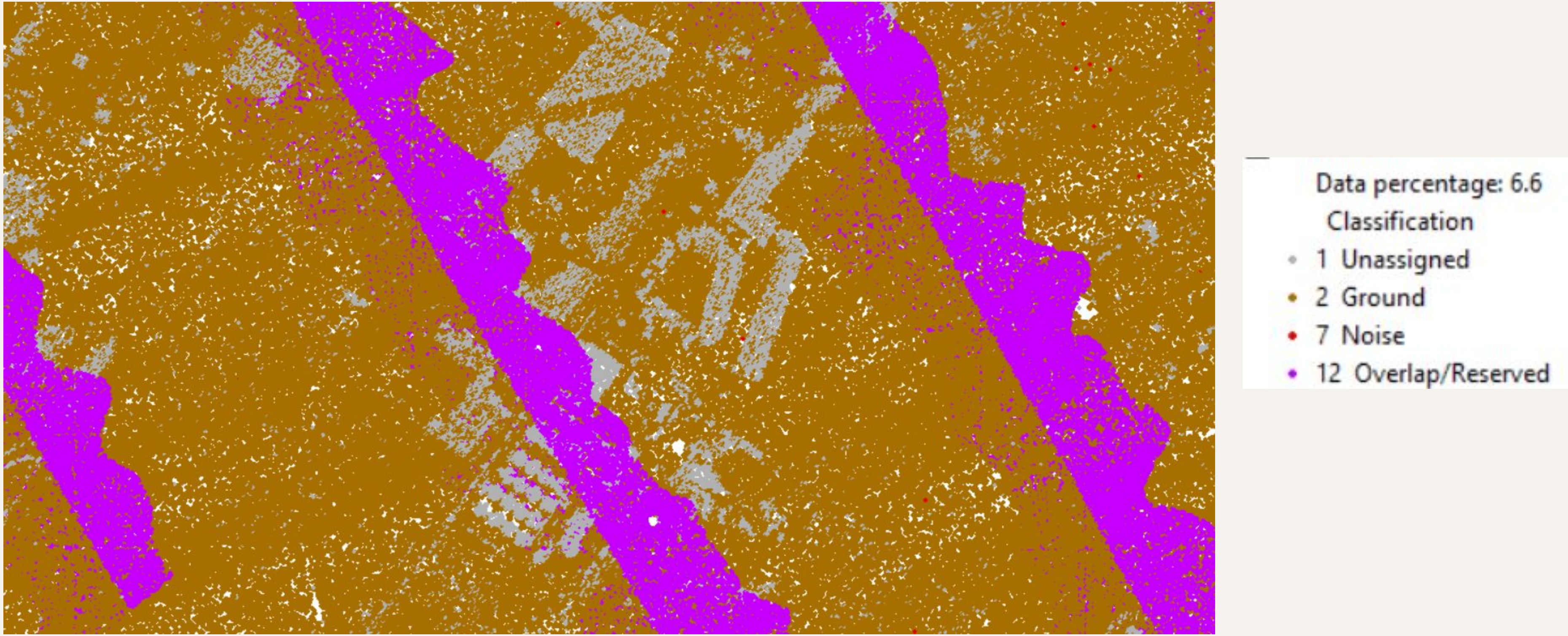

LAS Dataset
New LasDataset.lasd
Filters
10
B
I
U
A
Elevation
Class
Return

Elevación

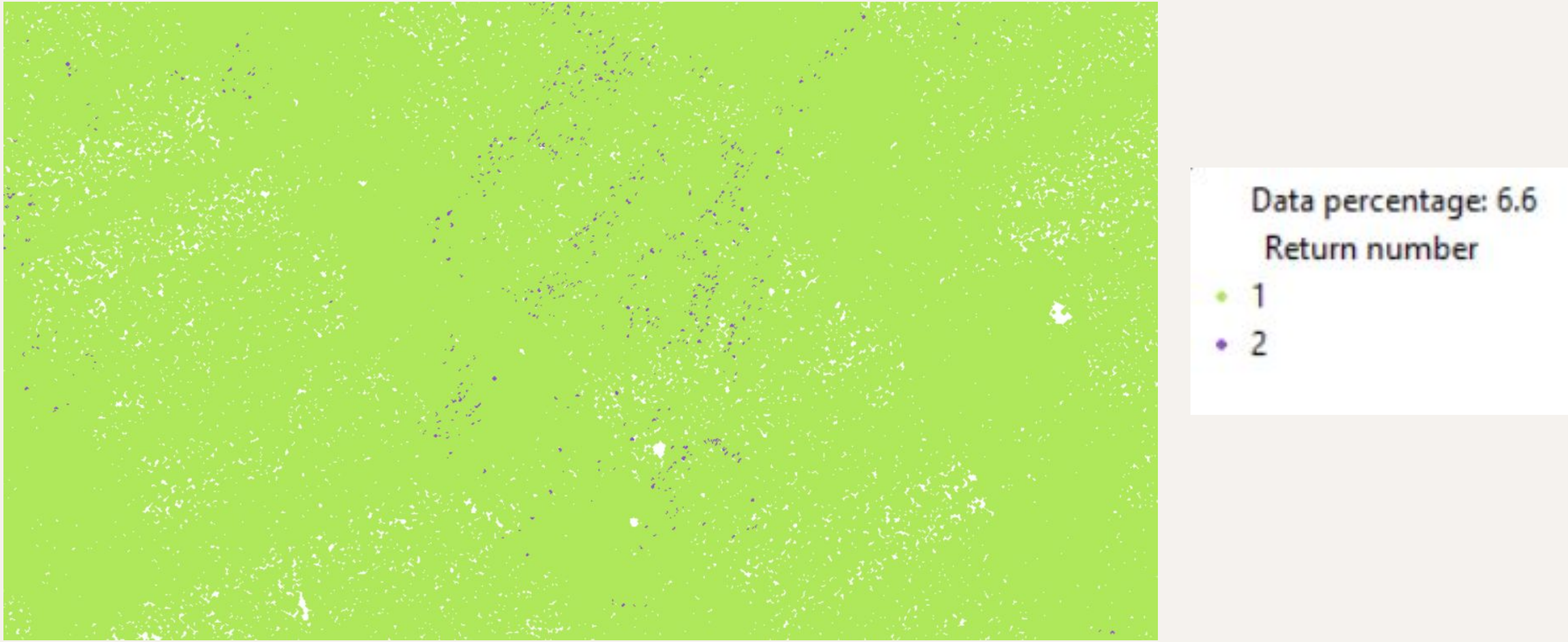

Data percentage: 6.6
LAS point elevation
● 51.98 - 813.07
● 47.59 - 51.98
● 43.2 - 47.59
● 38.81 - 43.2
● 34.42 - 38.81
● 30.03 - 34.42
● 25.64 - 30.03
● 21.25 - 25.64
● -356.99 - 21.25


N
Image © 2023 Airbus
Google Earth
1985
Fechas de imágenes: 8/14/2023
32°57'20.37" S
53°57'14.19" O
elevación
0 m
alt. ojo
2.66 km

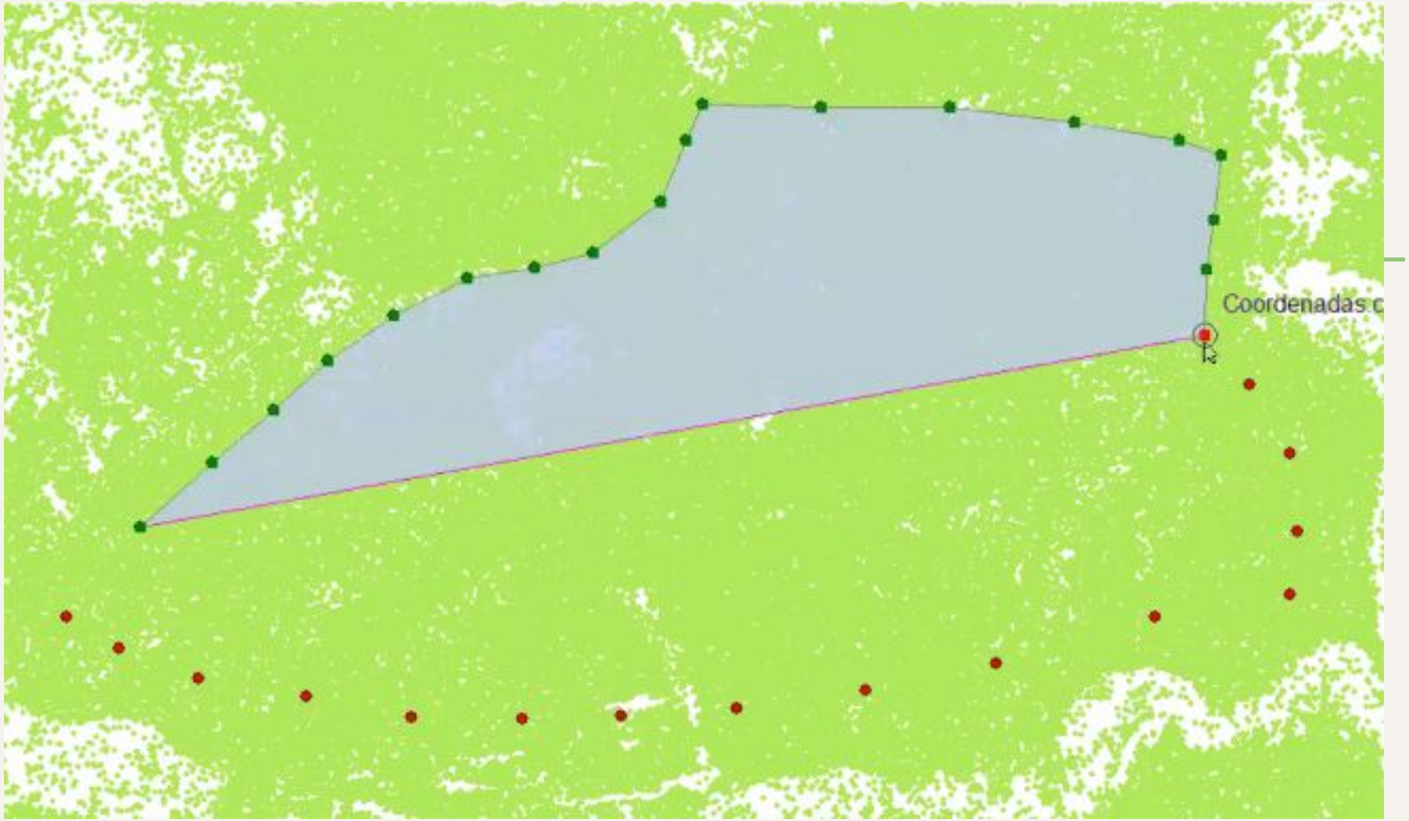
Clasificación


Data percentage: 6.6
Classification
● 1 Unassigned
● 2 Ground
● 7 Noise
● 12 Overlap/Reserved

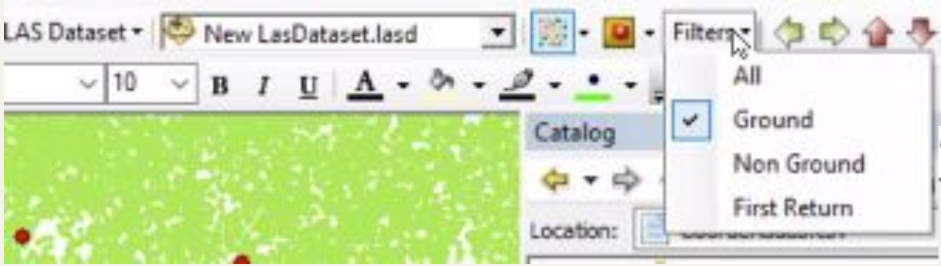
Cantidad de retornos



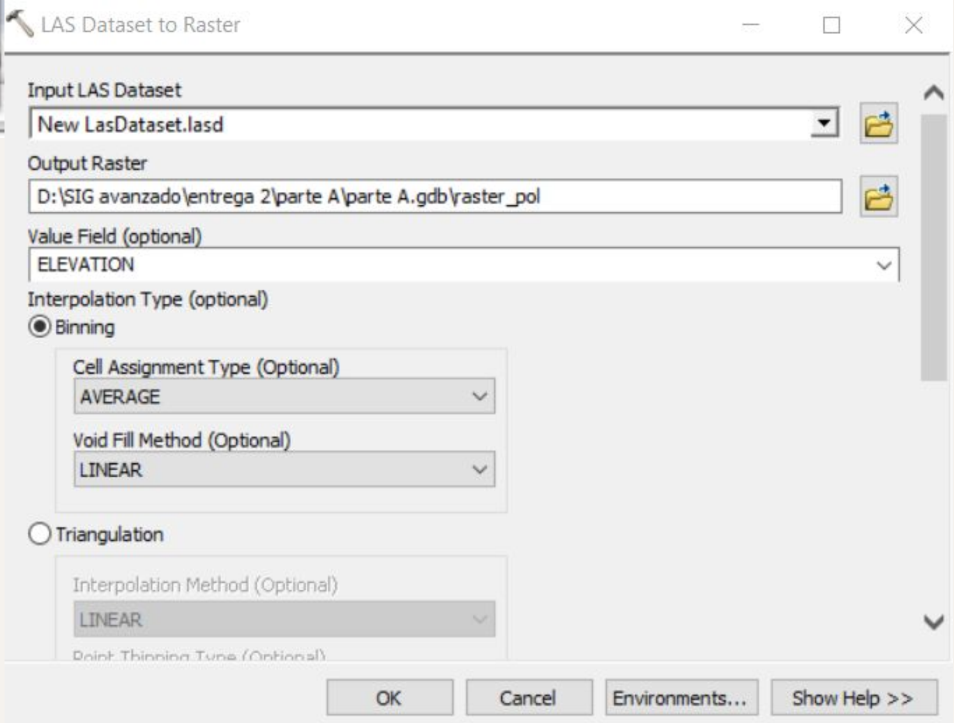
Creación del polígono:


Coordenadas c

Generar el Modelo Digital de Terreno (MDT):


LAS Dataset
New LasDataset.lasd
10
Catalog
Location:

Filters
- All
- ✓ Ground
- Non Ground
- First Return


LAS Dataset to Raster

Input LAS Dataset: New LasDataset.lasd

Output Raster: D:\SIG avanzado\entrega 2\parte A\parte A.gdb\raster_pol

Value Field (optional): ELEVATION

Interpolation Type (optional)

● Binning

Cell Assignment Type (Optional): AVERAGE

Void Fill Method (Optional): LINEAR

○ Triangulation

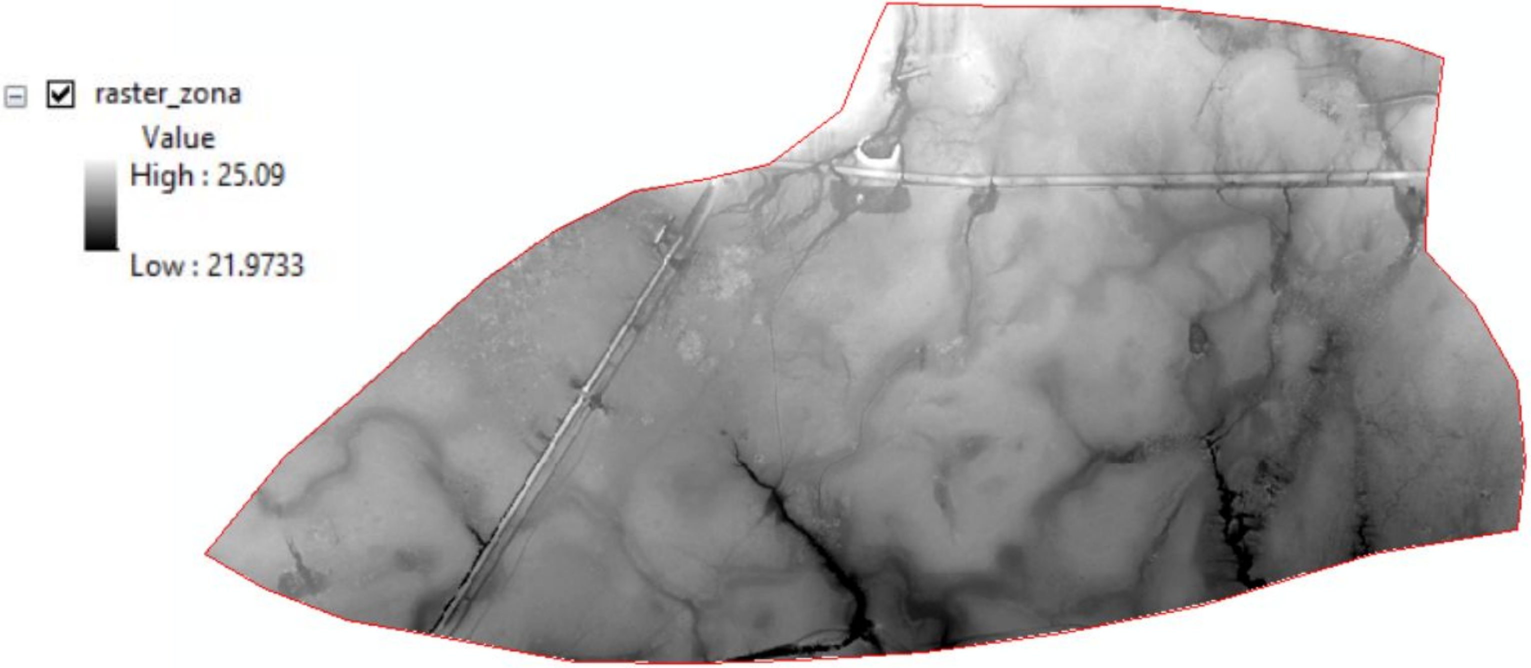
Interpolation Method (Optional): LINEAR

Point Thinning Type (Optional)

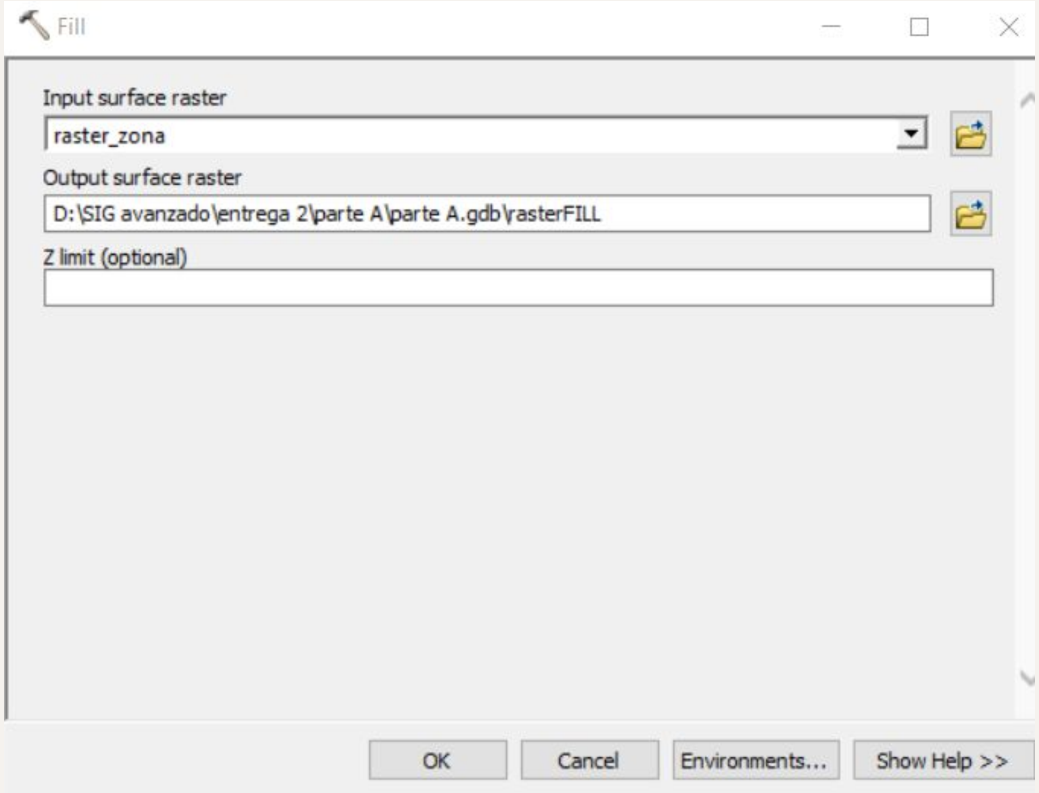
OK
Cancel
Environments...
Show Help >>

Tamaño de pixel: 2m

Modelo Digital de Terreno (MDT):


☑ raster_zona
Value
High : 25.09
Low : 21.9733

Rellenado



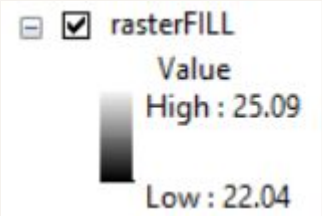
Fill

Input surface raster: raster_zona

Output surface raster: D:\SIG avanzado\entrega 2\parte A\parte A.gdb\rasterFILL

Z limit (optional):

OK
Cancel
Environments...
Show Help >>



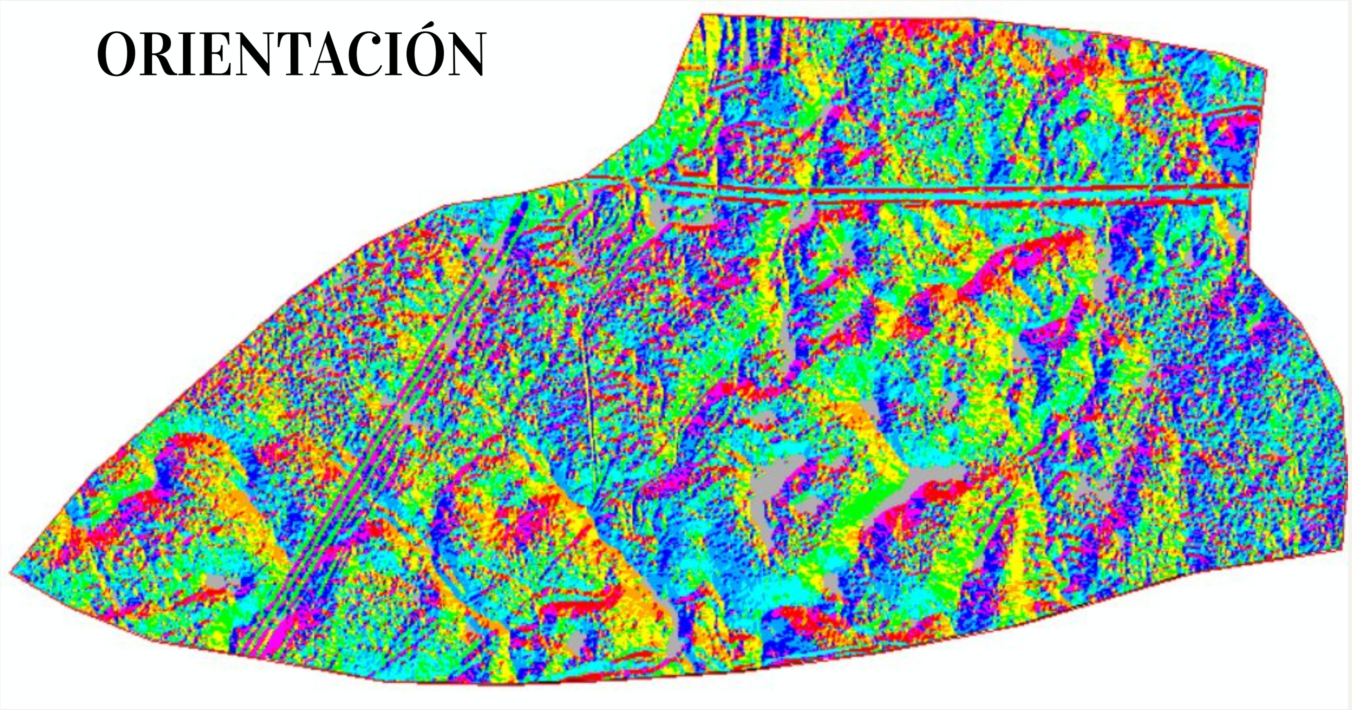
☑ rasterFILL

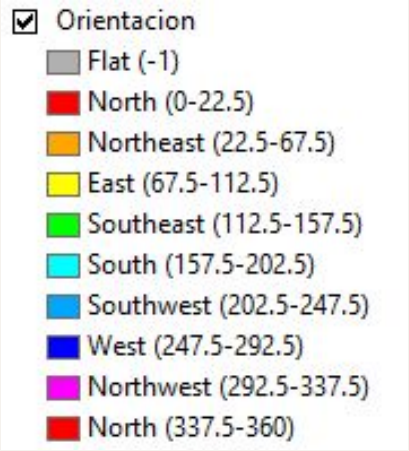
Value

High : 25.09

Low : 22.04

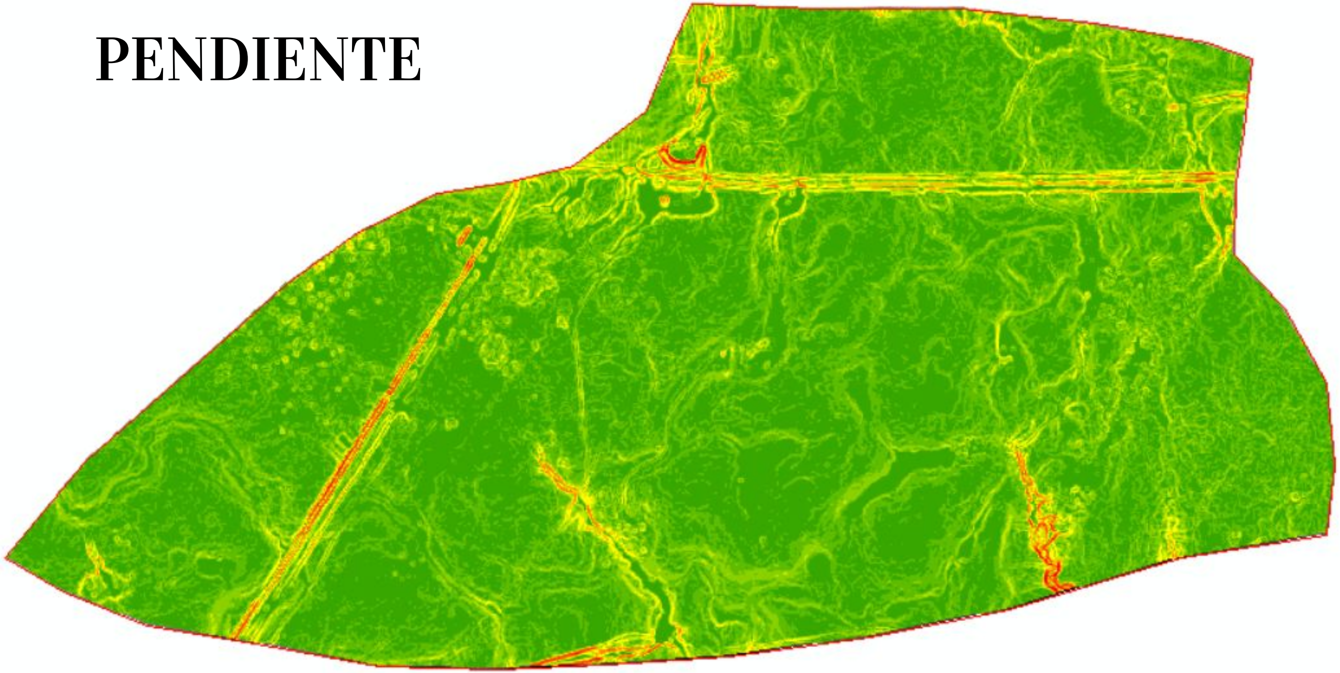
Subproductos del MDT:

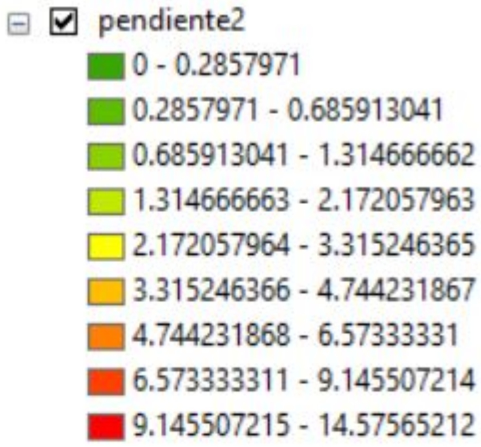




☑ Orientacion
⬜ Flat (-1)
🟥 North (0-22.5)
🟧 Northeast (22.5-67.5)
🟨 East (67.5-112.5)
🟩 Southeast (112.5-157.5)
🟦 South (157.5-202.5)
🟦 Southwest (202.5-247.5)
🟦 West (247.5-292.5)
🟪 Northwest (292.5-337.5)
🟥 North (337.5-360)

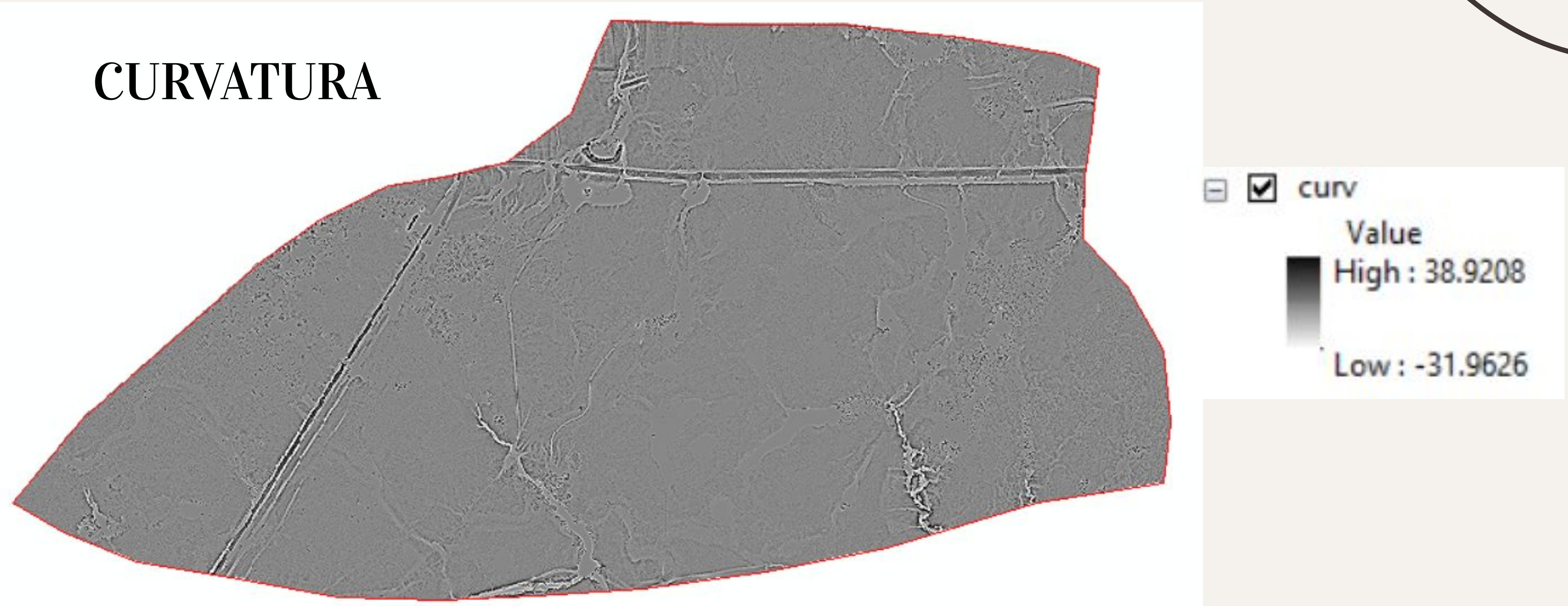
PENDIENTE





⊟ ☑ pendiente2
- 🟩 0 - 0.2857971
- 🟩 0.2857971 - 0.685913041
- 🟩 0.685913041 - 1.314666662
- 🟩 1.314666663 - 2.172057963
- 🟨 2.172057964 - 3.315246365
- 🟧 3.315246366 - 4.744231867
- 🟧 4.744231868 - 6.57333331
- 🟥 6.573333311 - 9.145507214
- 🟥 9.145507215 - 14.57565212

CURVATURA


☑ curv
Value
High : 38.9208
Low : -31.9626

GRACIAS