

ESERCITAZIONI 2

- A. importazioni punti da LiDAR, densità, data voids, contour lines, TIN, TIN to raster
- B. estrazione profilo topografico
- C. verifica accuratezza verticale

Geodatabase

I geodatabase (database spaziali o Spatial DBMS) sono **archivi di dati geografici memorizzati su database relazionali (RDBMS, Relational DataBase Management System) e non su file system** (come, ad esempio, gli Shapefile).

Geodatabase

The image shows a screenshot of a geodatabase structure. At the top is a folder icon labeled "ESERCITAZIONE.mdb". Below it are several data layers, each with a small grid icon representing a raster. These are: "Aspect_ASTER", "Aspect_DTM_10m", "Aspect_DTM_1m", "Aspect_SRTM", "PlanCurv_DTM_1m", and "ProfCurv_DTM_1m". Below these are two feature class icons: "Punti" (a square with a dot) and "Punti_area" (a square with a grid). Blue arrows point from the "ESERCITAZIONE.mdb" folder to the text "geodatabase". A red bracket groups the six raster layers, with an arrow pointing to the text "raster". Blue arrows point from the "Punti" icon to the text "Feature class puntuale" and from the "Punti_area" icon to the text "Feature class areale".

ESERCITAZIONE.mdb → geodatabase

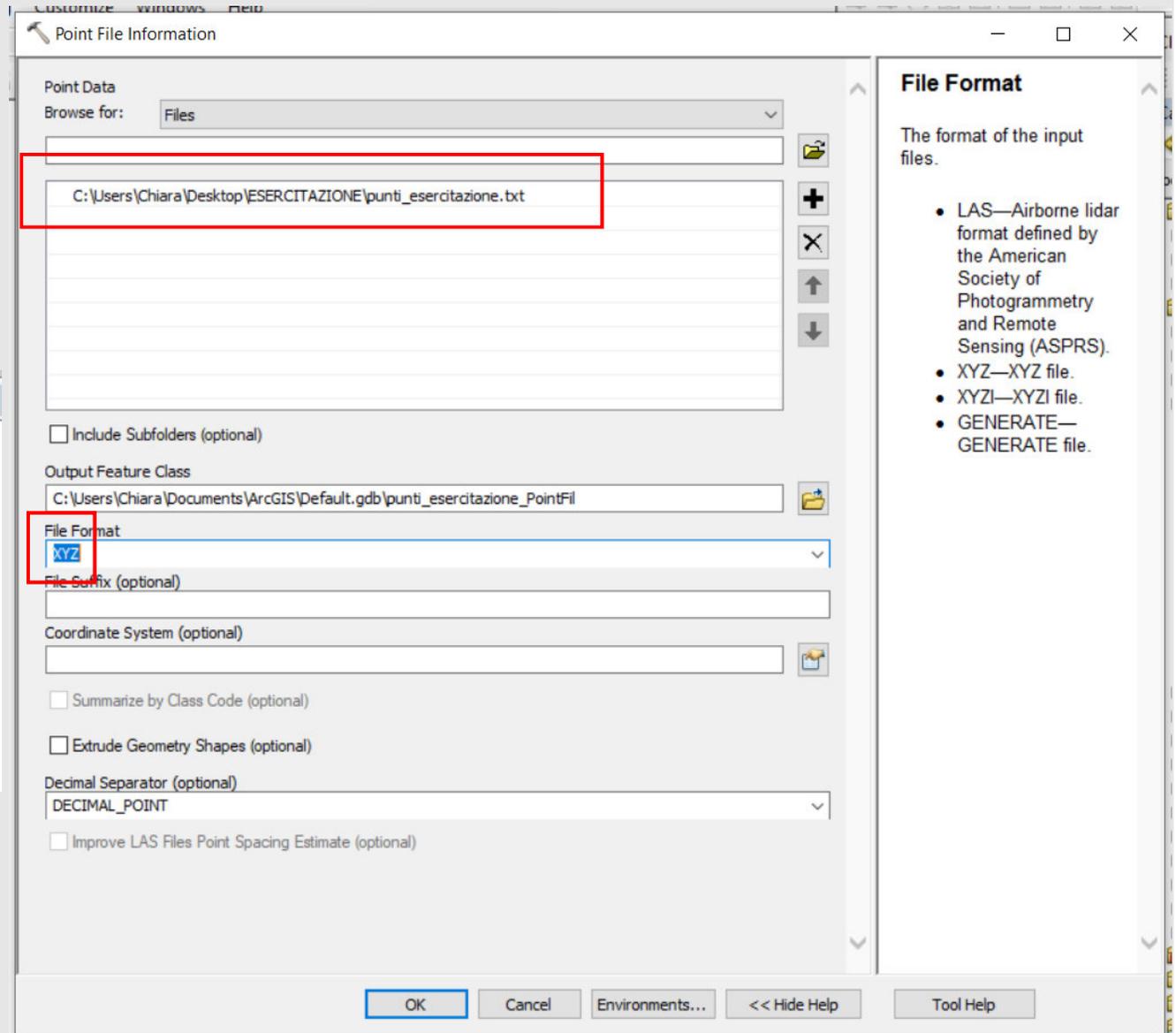
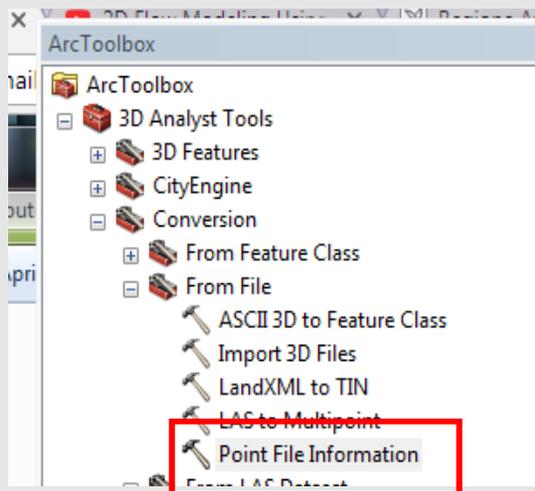
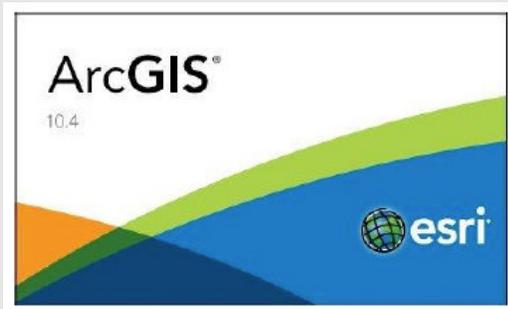
Aspect_ASTER
Aspect_DTM_10m
Aspect_DTM_1m
Aspect_SRTM
PlanCurv_DTM_1m
ProfCurv_DTM_1m

→ raster

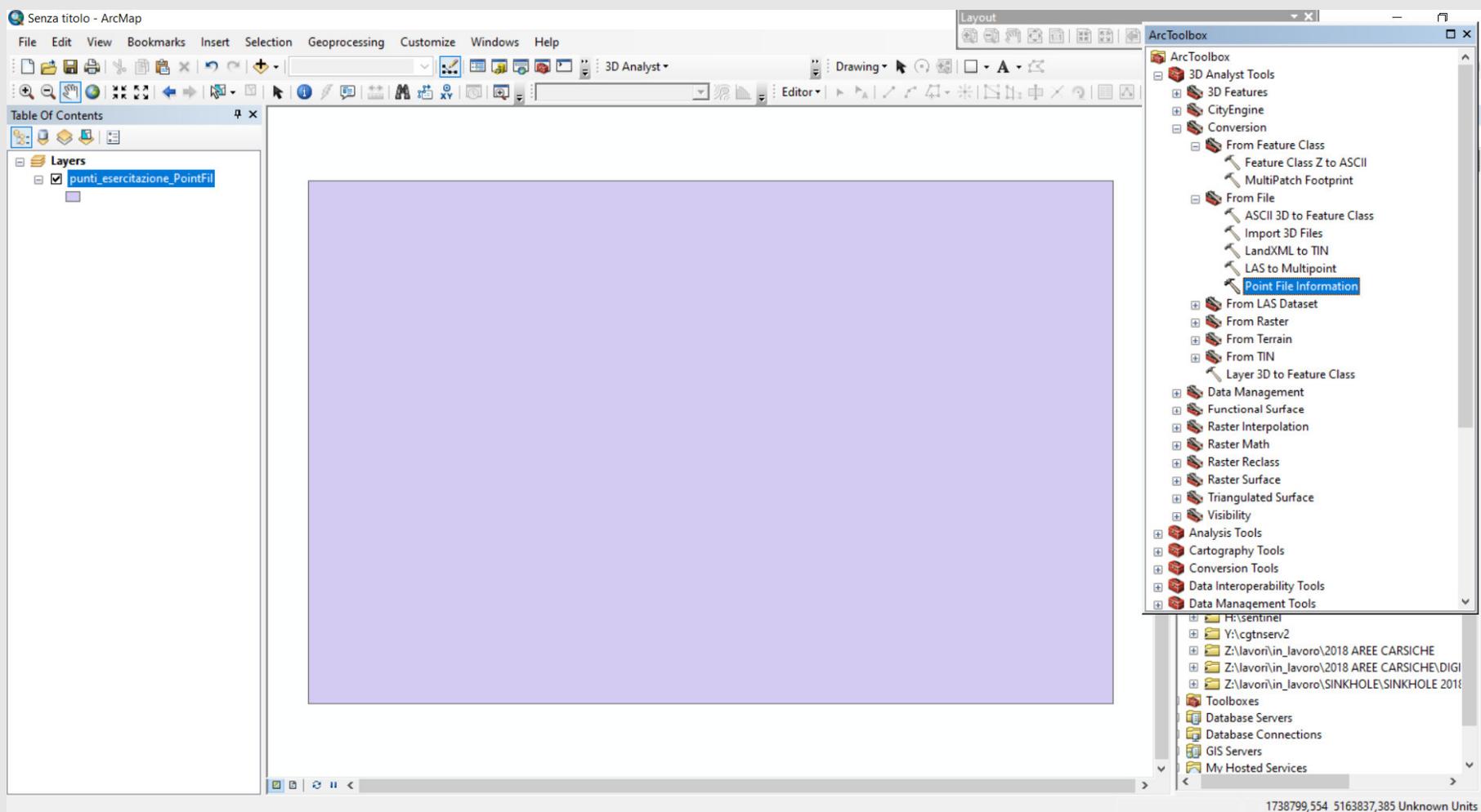
Punti → Feature class puntuale

Punti_area → Feature class areale

Importazione punti LiDAR, dominio di esistenza dei punti



Importazione punti LiDAR, dominio di esistenza dei punti



Importazione file ASCII punti LiDAR

The screenshot displays the ArcGIS interface with the 'ASCII 3D to Feature Class' tool selected in the ArcToolbox. The tool's configuration window is open, showing the following settings:

- Input:** Browse for: Files. Path: C:\Users\Chiara\Desktop\ESERCITAZIONE\punti_esercitazione.txt.
- Input File Format:** XYZ.
- Output Feature Class:** C:\Users\Chiara\Documents\ArcGIS\Default.gdb\punti_esercitazione_ASCII3DT.
- Output Feature Class Type:** POINT.
- Z Factor (optional):** 1.
- Coordinate System (optional):** (empty).
- Average Point Spacing (optional):** (empty).
- File Suffix (optional):** (empty).
- Decimal Separator (optional):** DECIMAL_POINT.

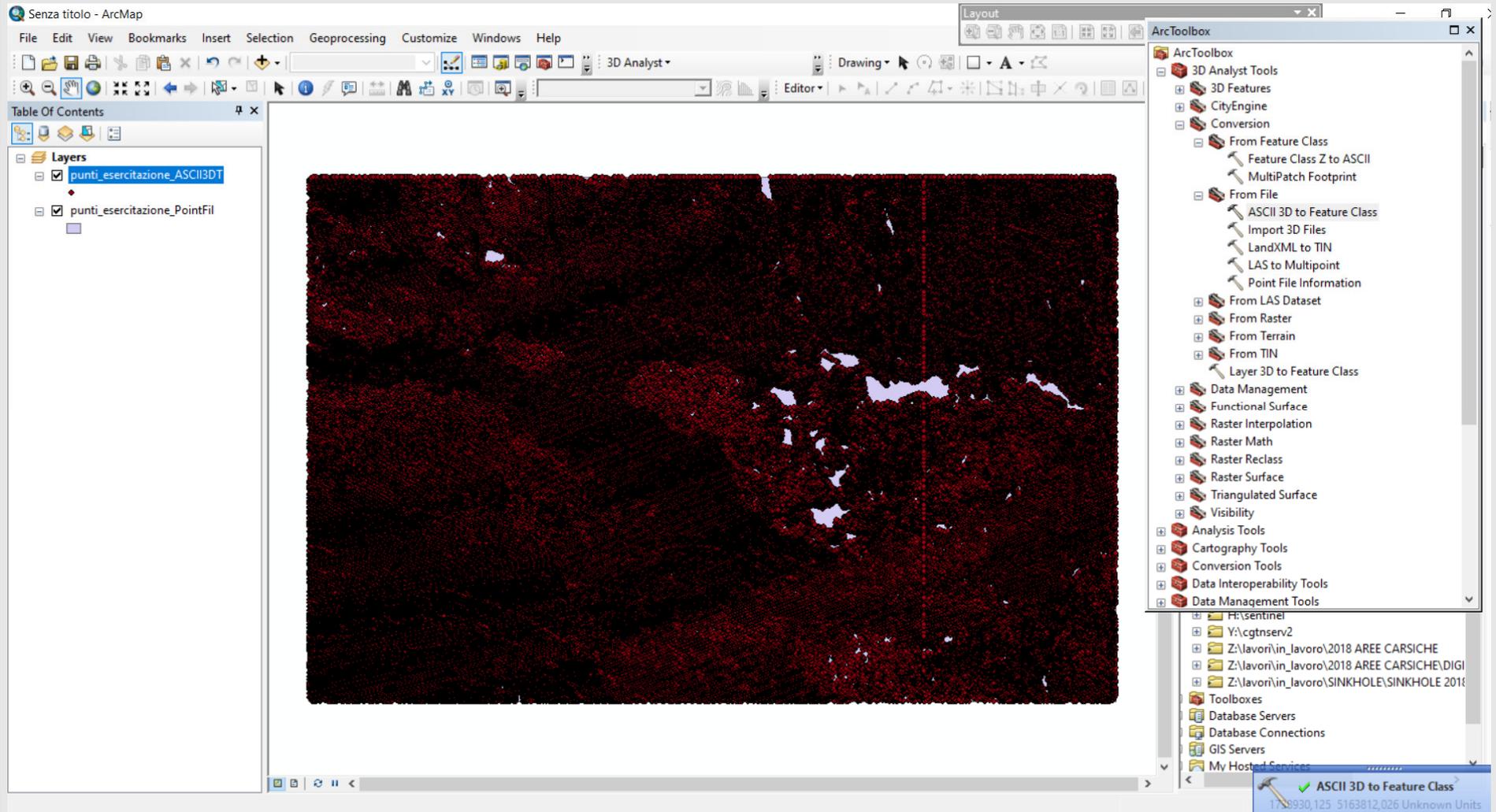
The 'Output Feature Class Type' section on the right lists the following options:

- MULTIPOINT**—Multipoints are recommended the input data contains a large number of points and attributes per feature are not required.
- POINT**—Each XYZ coordinate will produce one point feature.
- POLYLINE**—The output will contain polyline features.
- POLYGON**—The output will contain polygon features.

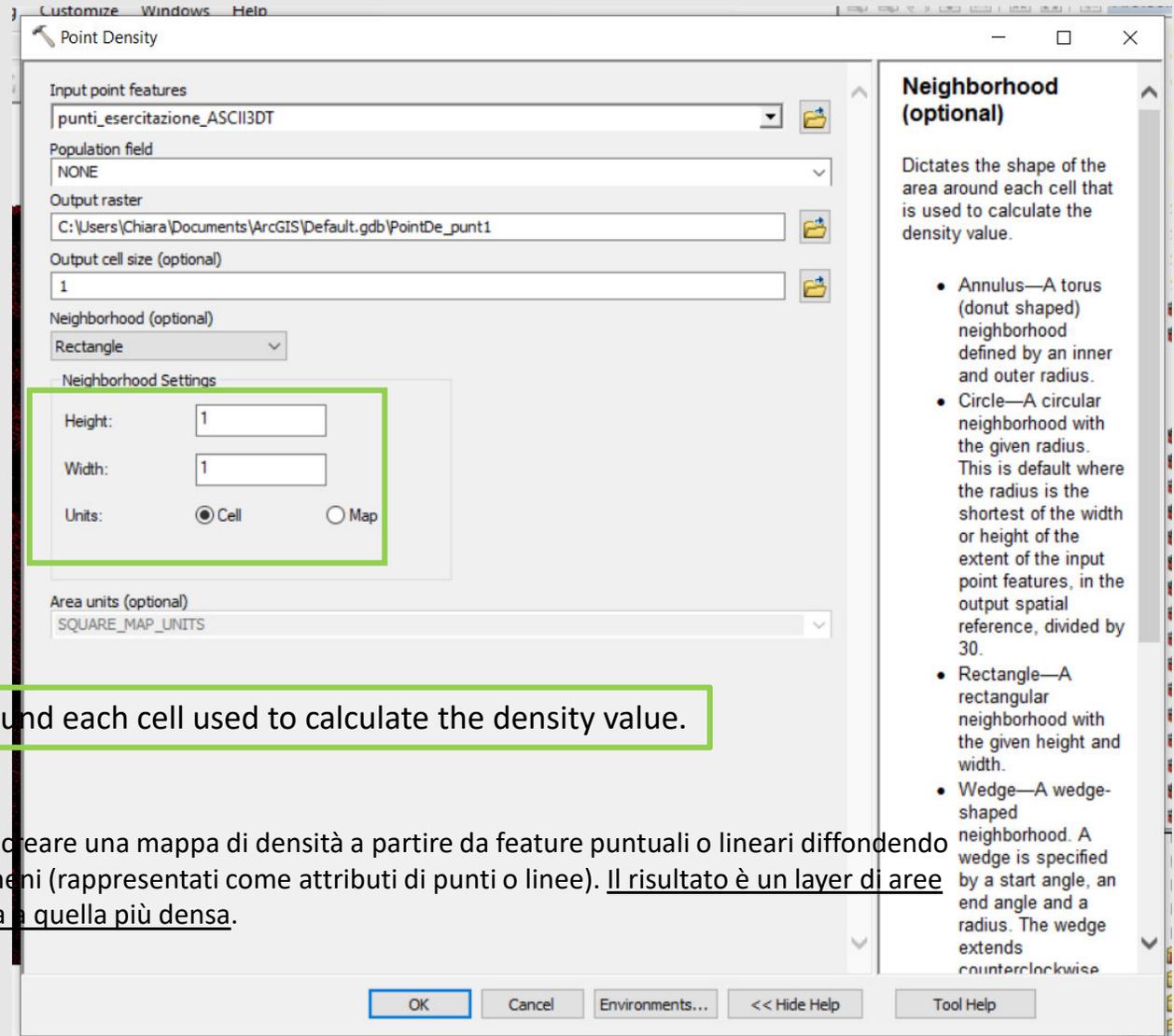
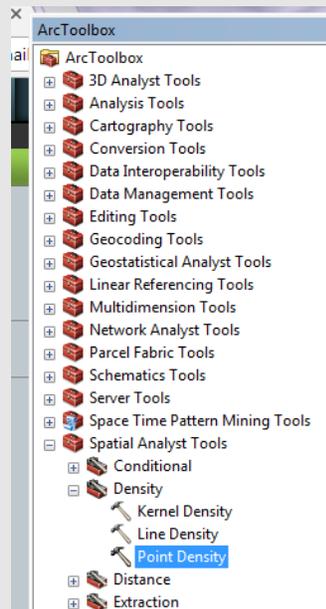
Buttons at the bottom include OK, Cancel, Environments..., << Hide Help, and Tool Help.

In questo modo creo uno .shp a partire da un .txt!!

Nuvola di punti LiDAR



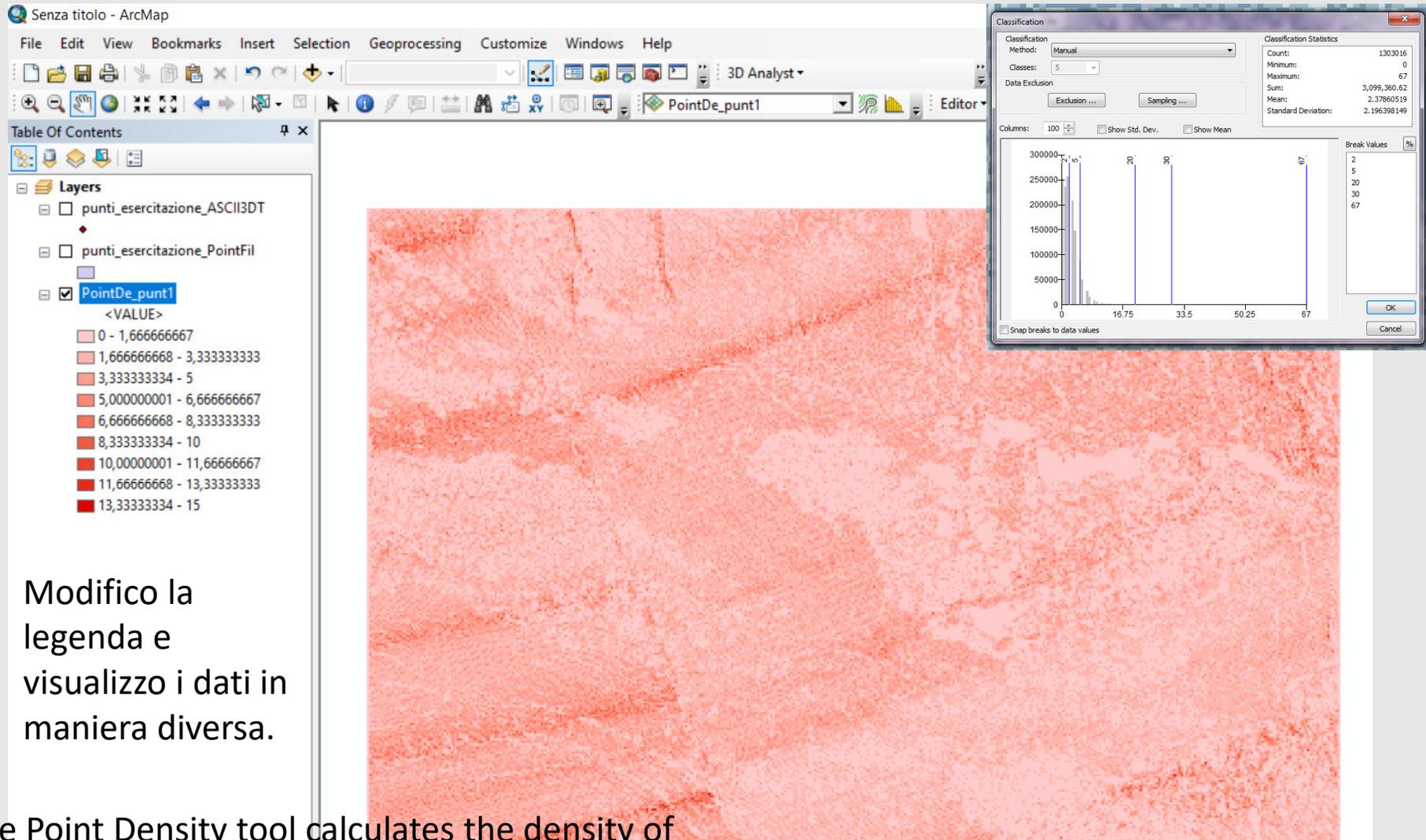
Verifico la DENSITA' dei miei dati



Dictates the shape of the area around each cell used to calculate the density value.

Lo strumento **Calcolo densità** consente di creare una mappa di densità a partire da feature puntuali o lineari diffondendo nella mappa quantità note di alcuni fenomeni (rappresentati come attributi di punti o linee). Il risultato è un layer di aree classificate a partire da quella meno densa a quella più densa.

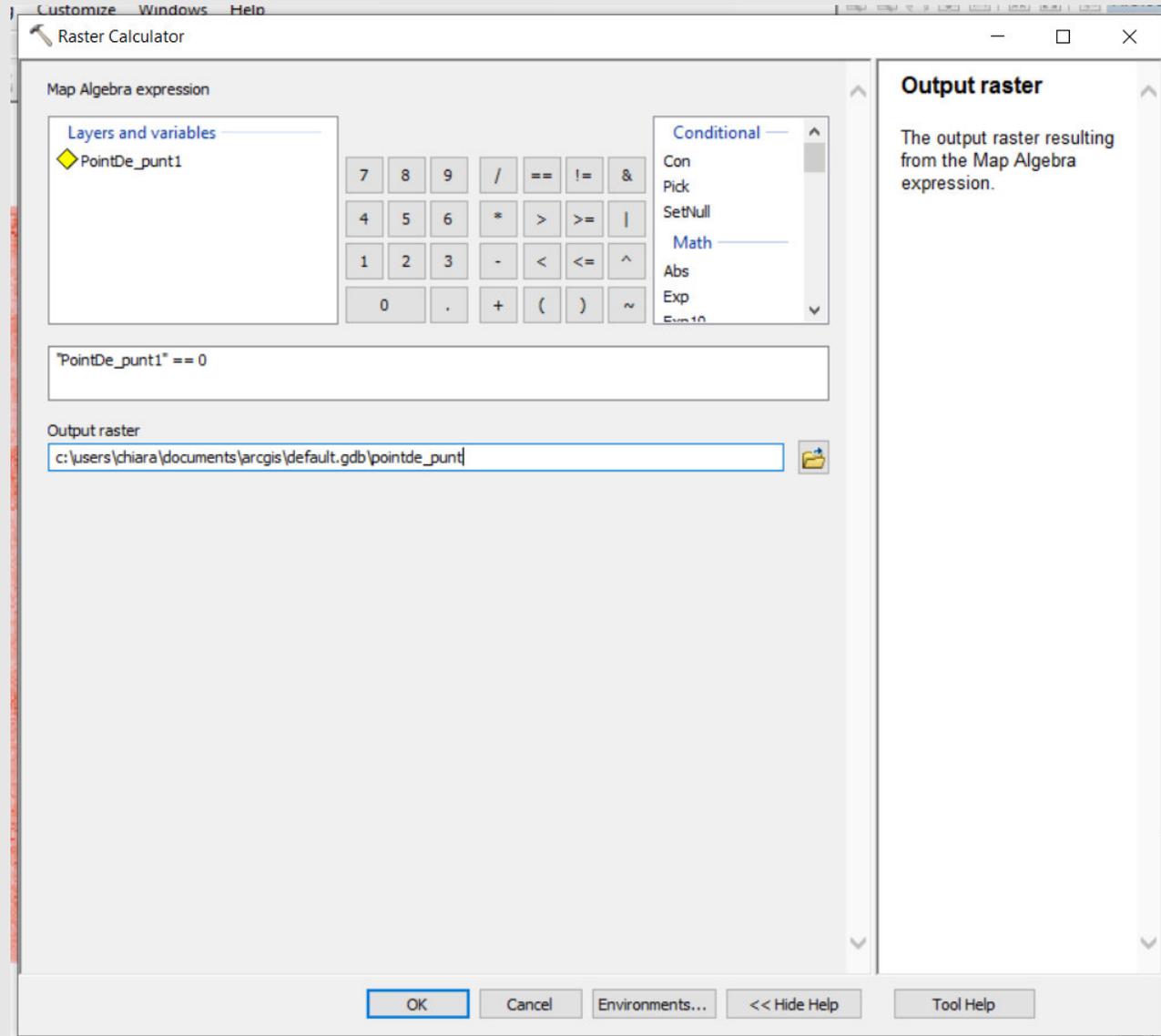
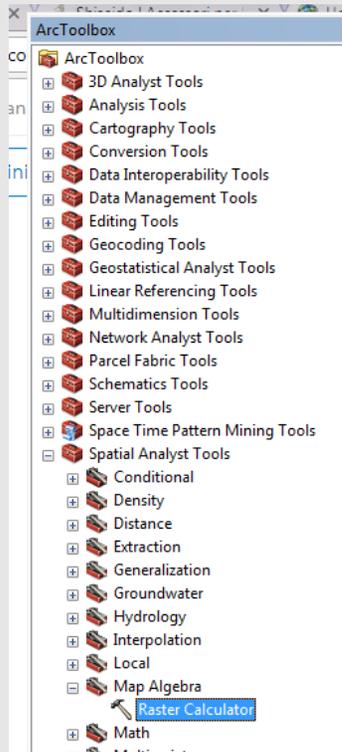
Verifico la DENSITA' dei miei dati



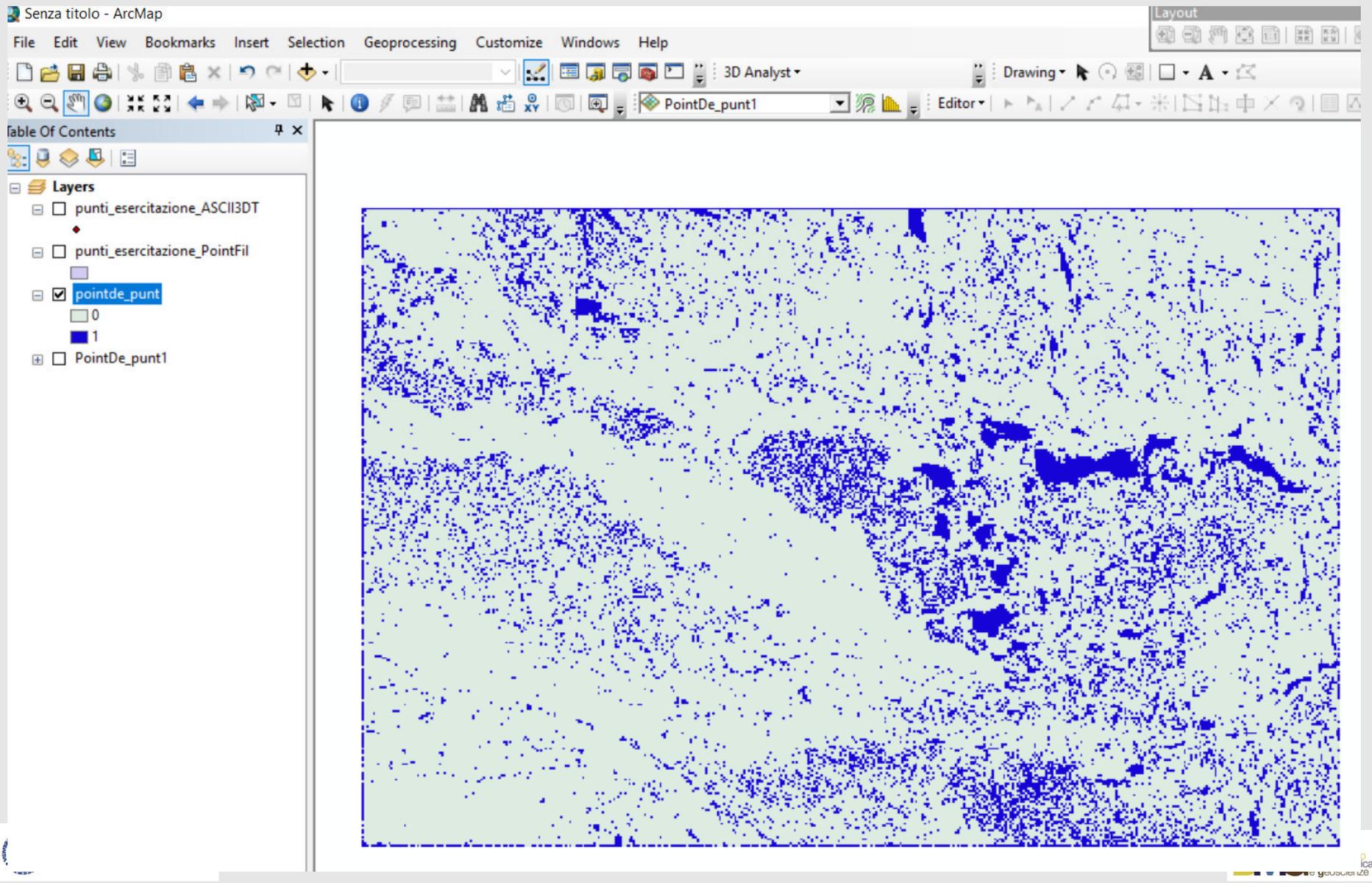
Modifico la
legenda e
visualizzo i dati in
maniera diversa.

The Point Density tool calculates the density of
point features around each output raster cell.

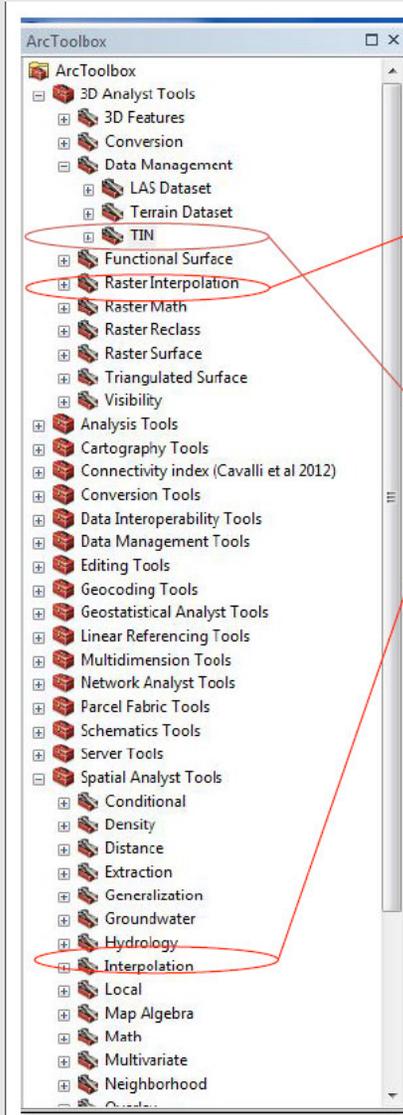
Individuazione dei «data voids»



Individuazione dei «data voids»



Interpolazione



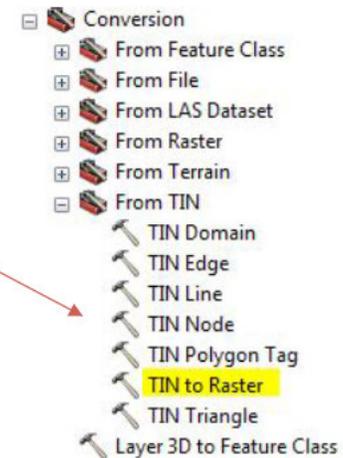
Disponibili diversi algoritmi di interpolazione.
Tenere in considerazione densità e presenza “data voids” nella scelta di:

- 1 dimensione della cella del modello digitale
- 2 algoritmo di interpolazione (e relativi parametri)

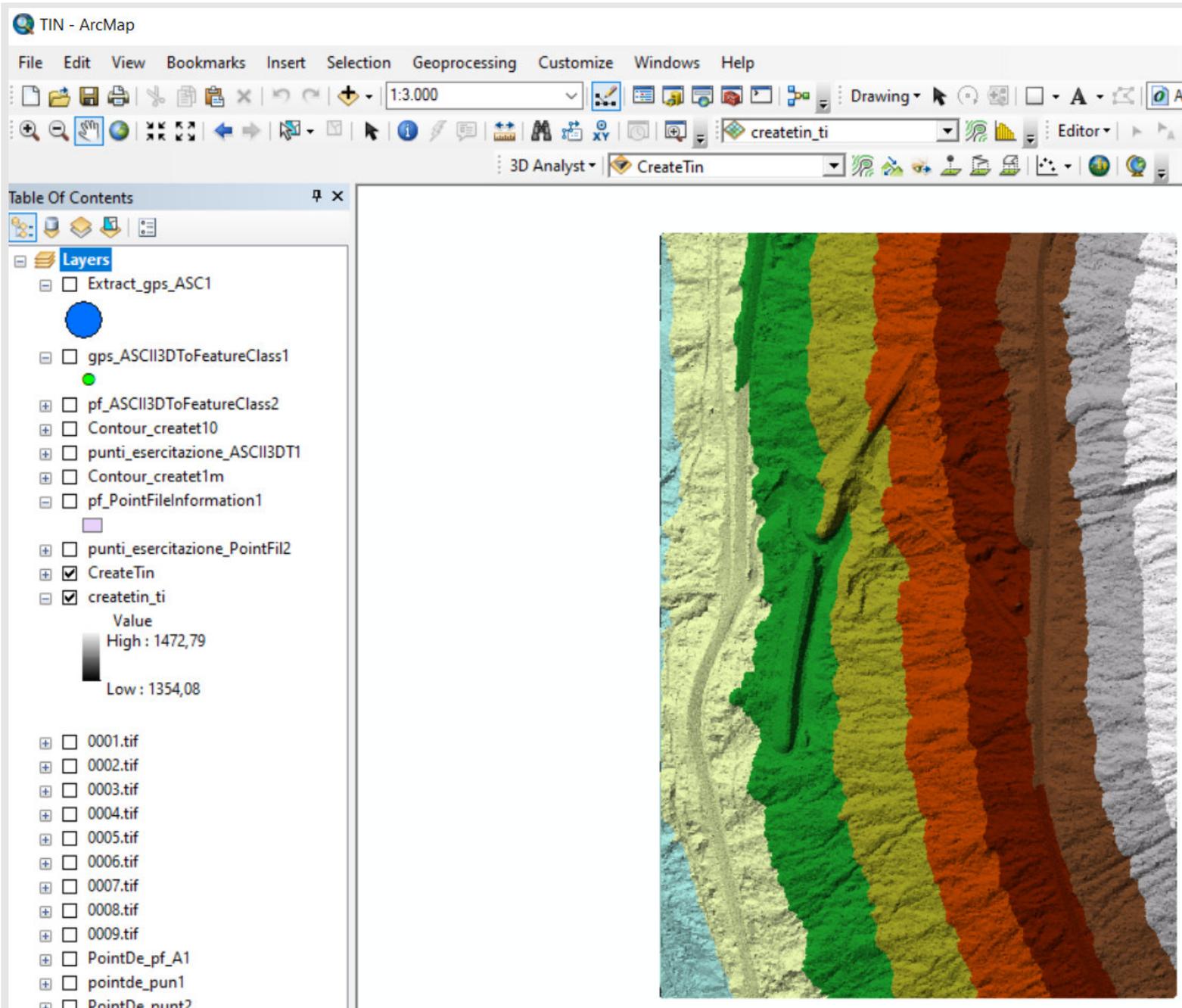
È possibile creare un TIN da 3D Analyst tools -> Data Management



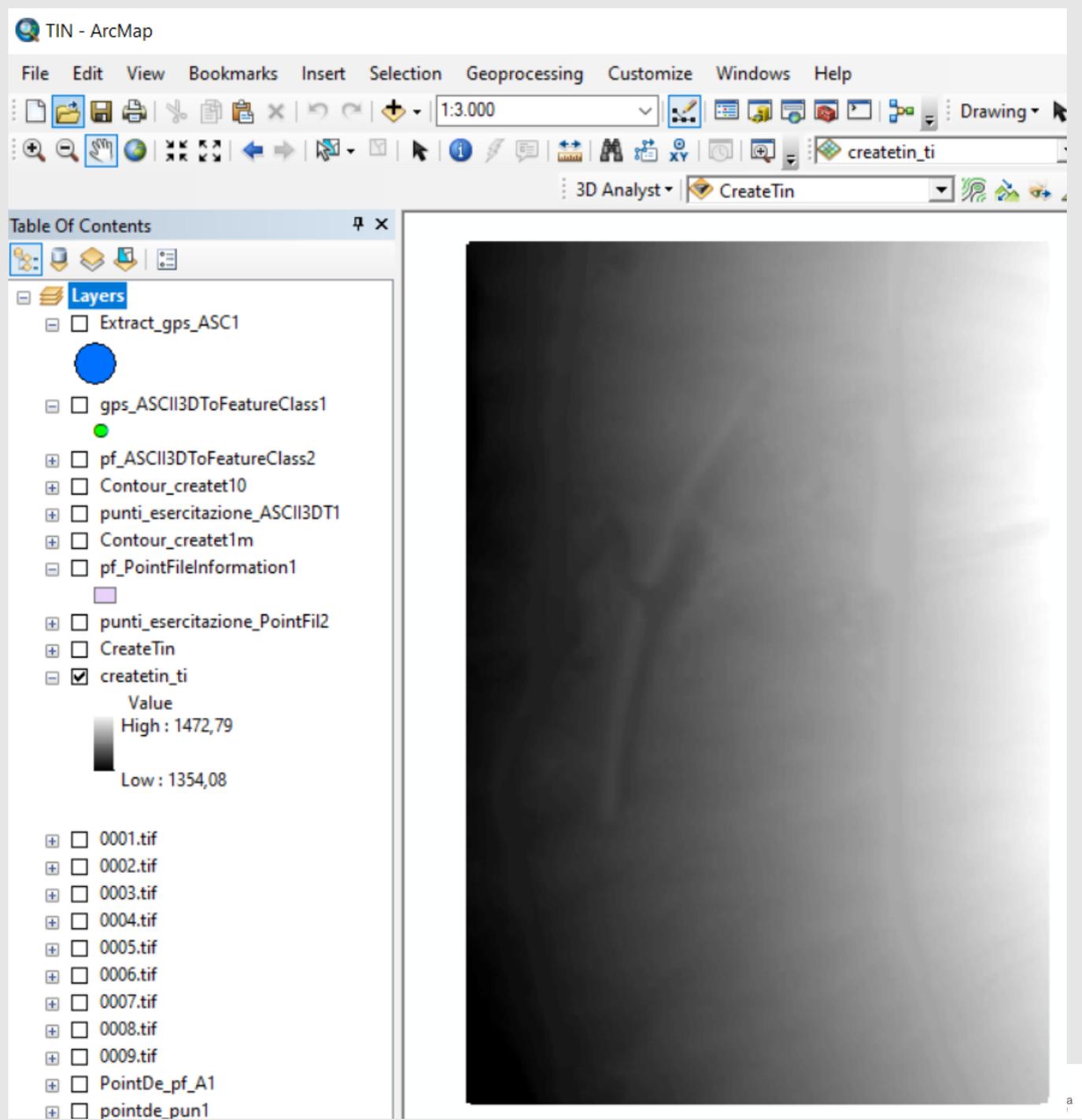
E convertire il TIN in raster



TIN



TIN to RASTER



TIN - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:3.000

Drawing

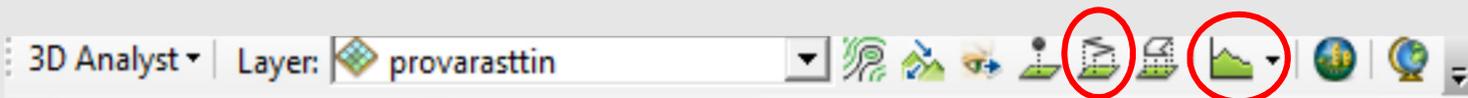
3D Analyst CreateTin createtin_ti

Table Of Contents

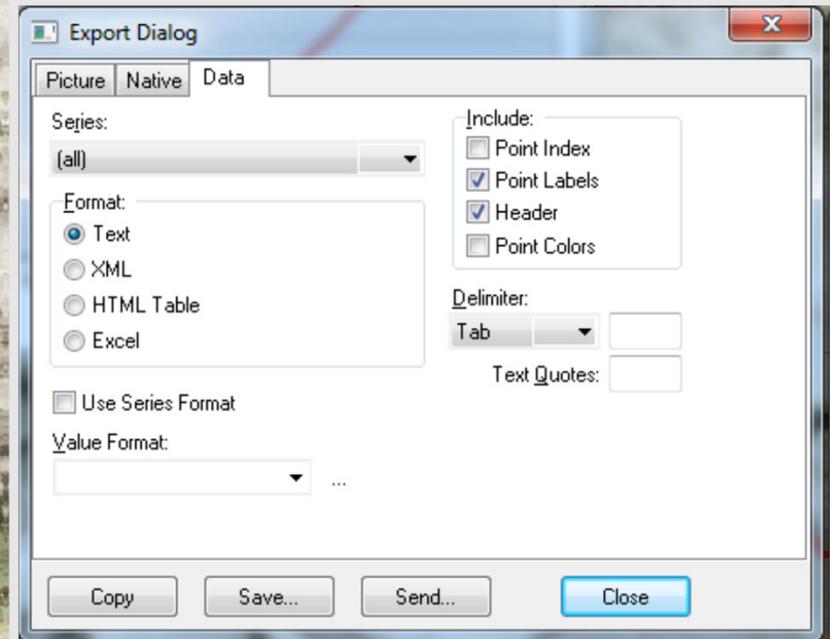
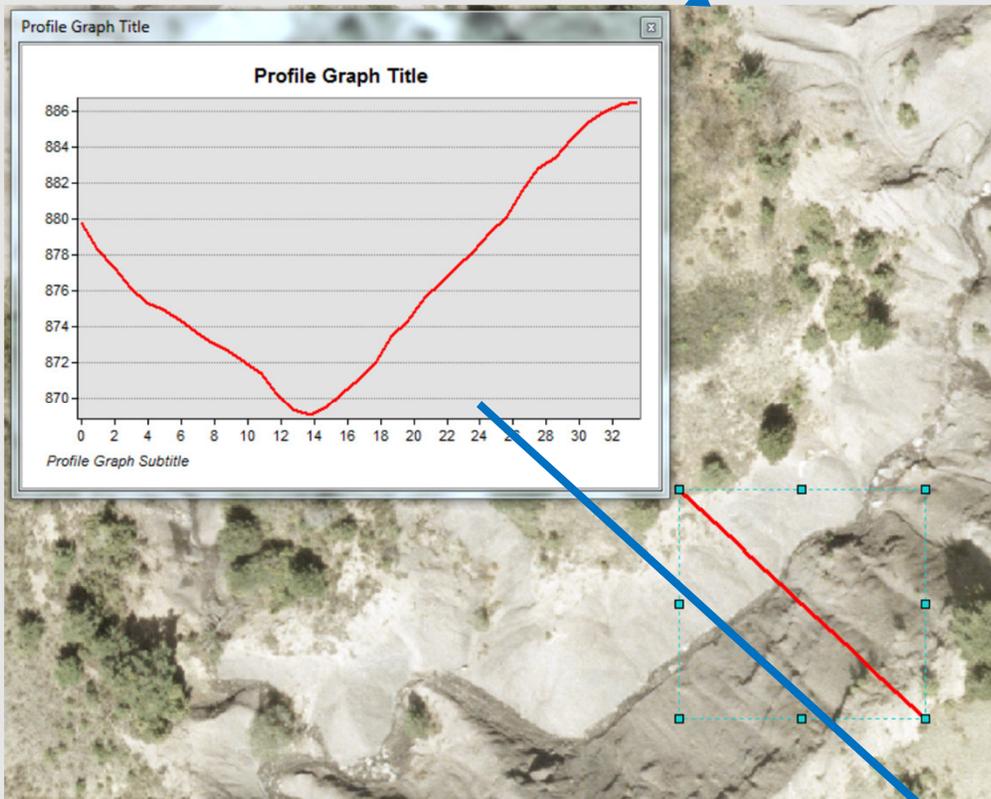
Layers

- Extract_gps_ASC1
- gps_ASCII3DToFeatureClass1
- pf_ASCII3DToFeatureClass2
- Contour_createt10
- punti_esercitazione_ASCII3D1
- Contour_createt1m
- pf_PointFileInformation1
- punti_esercitazione_PointFil2
- CreateTin
- createtin_ti
 - Value
 - High : 1472,79
 - Low : 1354,08
- 0001.tif
- 0002.tif
- 0003.tif
- 0004.tif
- 0005.tif
- 0006.tif
- 0007.tif
- 0008.tif
- 0009.tif
- PointDe_pf_A1
- pointde_pun1

Estrazione di un profilo topografico

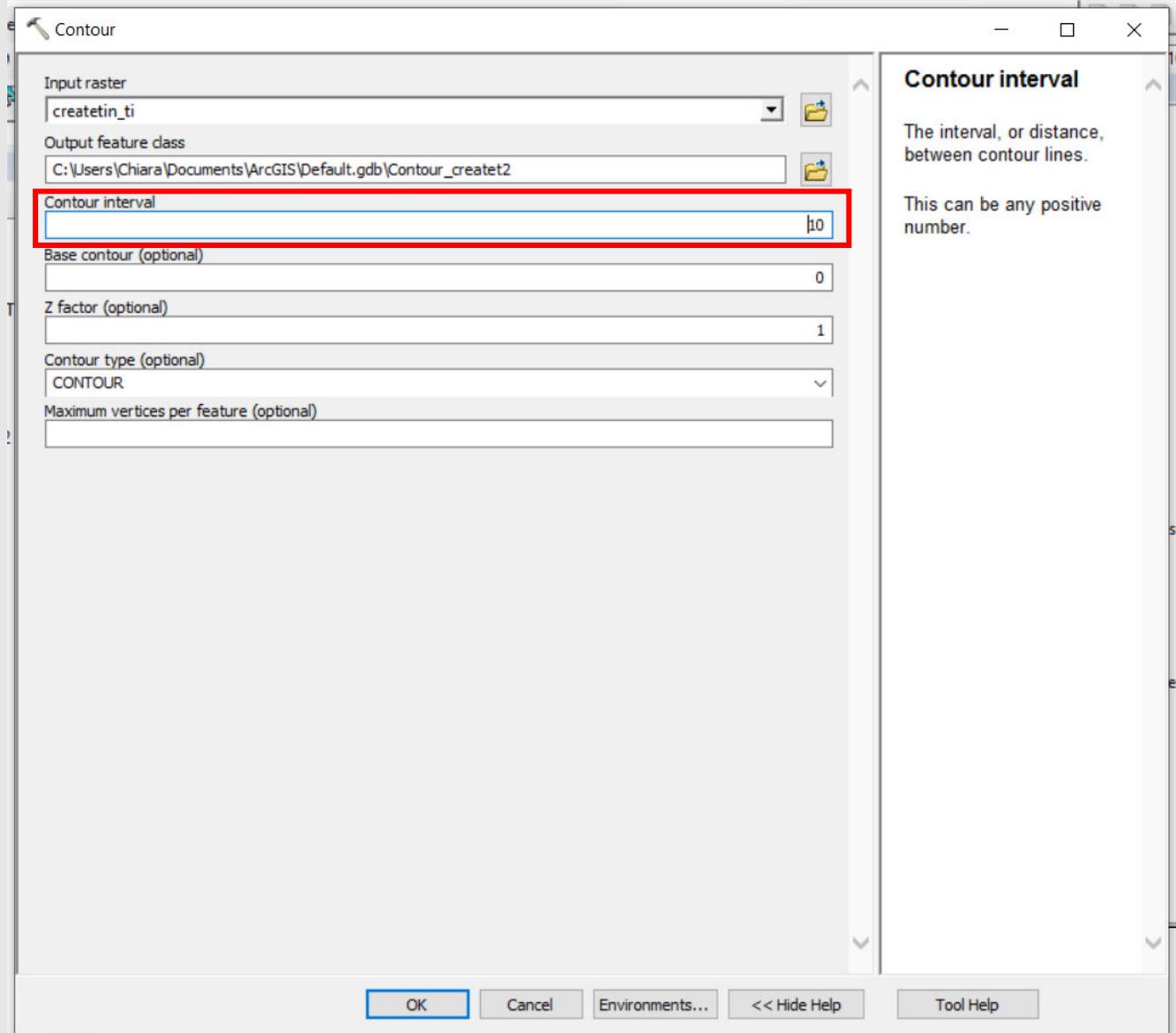
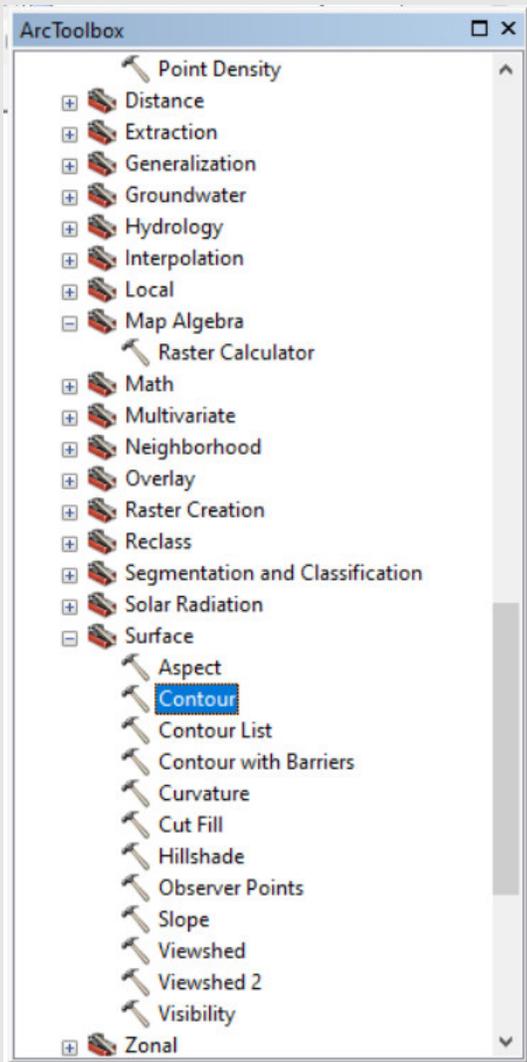


E' un'operazione estremamente utile e veloce che permette di verificare la qualità del dato che si sta utilizzando.



Per esportare utilizzo il tasto dx sul grafico

CONTOUR



CONTOUR lines 10m spaced

The screenshot displays the ArcGIS Desktop interface. The main map area shows a grayscale elevation map with blue contour lines. The 'Table of Contents' panel on the left lists several layers, with 'Contour_createt1' selected and highlighted in blue. Below it, the 'createtin_ti' layer is visible with a legend showing elevation values ranging from 1354,08 to 1459,696. The 'ArcToolbox' panel on the right is open, showing various geoprocessing tools, with the 'Contour' tool highlighted in blue. The 'Contour' tool is located under the 'Surface' category. The 'Table of Contents' panel also shows a legend for 'createtin_ti' with a grayscale ramp and the following values: High: 1472,79 and Low: 1354,08.

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

3D Analyst CreateTin

Table of Contents

Layers

- pf_ASCII3DToFeatureClass2
- punti_esercitazione_ASCII3DT1
- Contour_createt1**
- pf_PointFileInformation1
- punti_esercitazione_PointFil2
- CreateTin
 - Elevation
 - 1459,696 - 1472,9
 - 1446,491 - 1459,696
 - 1433,287 - 1446,491
 - 1420,082 - 1433,287
 - 1406,878 - 1420,082
 - 1393,673 - 1406,878
 - 1380,469 - 1393,673
 - 1367,264 - 1380,469
 - 1354,06 - 1367,264
- createtin_ti
 - Value
 - High : 1472,79
 - Low : 1354,08
- 0001.tif
- 0002.tif

ArcToolbox

- Point Density
- Distance
- Extraction
- Generalization
- Groundwater
- Hydrology
- Interpolation
- Local
- Map Algebra
- Raster Calculator
- Math
- Multivariate
- Neighborhood
- Overlay
- Raster Creation
- Reclass
- Segmentation and Classification
- Solar Radiation
- Surface
 - Aspect
 - Contour**
 - Contour List
 - Contour with Barriers
 - Curvature
 - Cut Fill
 - Hillshade
 - Observer Points
 - Slope
 - Viewshed
 - Viewshed 2
 - Visibility
- Zonal

Importazione punti di controllo

The screenshot displays the ArcGIS interface during the process of importing control points. The main window is titled 'ASCII 3D to Feature Class' and shows the 'Input' field with the file path: `H:\CHIARA\00_RICERCA\CORSI AGGIORNAMENTO\GEOMORPHOMETRY 2017\Geomorfometria\dati\gps.txt`. The 'Output Feature Class Type' window is open, listing options: MULTIPOINT, POINT, POLYLINE, and POLYGON. The 'ArcToolbox' window is also visible, showing the 'From File' category with the 'ASCII 3D to Feature Class' tool highlighted. The 'Table of Contents' shows a 3D terrain map with several blue circular control points overlaid. The map's legend indicates a value range from 1354,08 (Low) to 1472,79 (High).

Output Feature Class Type

The geometry type of the output feature class.

- MULTIPOINT—Multipoints are recommended if the input data contains a large number of points and attributes per feature are not required.
- POINT—Each XYZ coordinate will produce one point feature.
- POLYLINE—The output will contain polyline features.
- POLYGON—The output will contain polygon features.

ArcToolbox

- 3D Analyst Tools
 - 3D Features
 - CityEngine
 - Conversion
 - From Feature Class
 - From File
 - ASCII 3D to Feature Class
 - Import 3D Files
 - LandXML to TIN

Table of Contents

Layers

- Extract_gps_ASC1
- gps_ASCII3DToFeatureClass1
- pf_ASCII3DToFeatureClass2
- Contour_createt10
- punti_esercitazione_ASCII3DT1
- Contour_createt1m
- pf_PointFileInformation1
- punti_esercitazione_PointFil2
- CreateTin
- createtin_ti

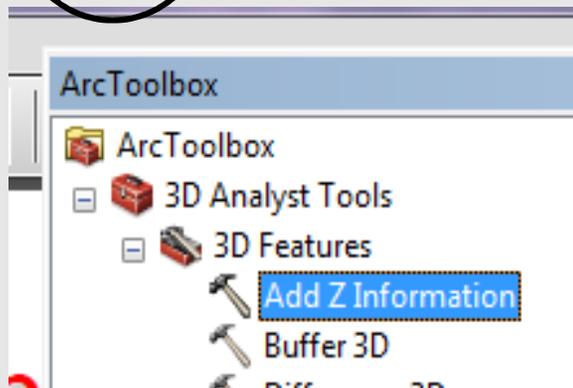
Value

High : 1472,79

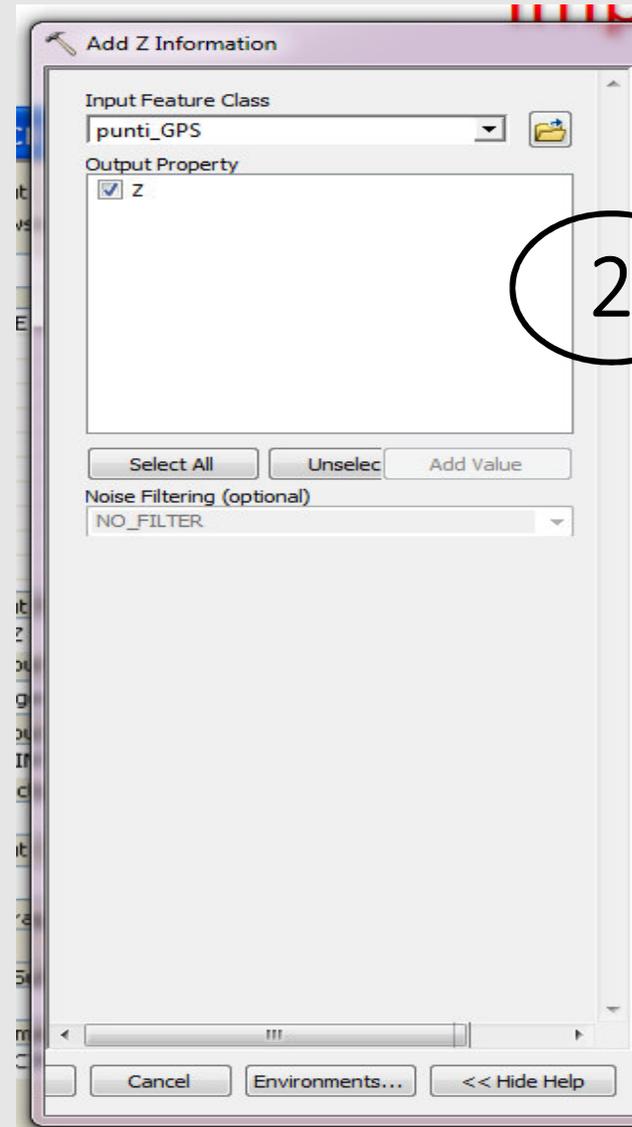
Low : 1354,08

Esplicitare le quote

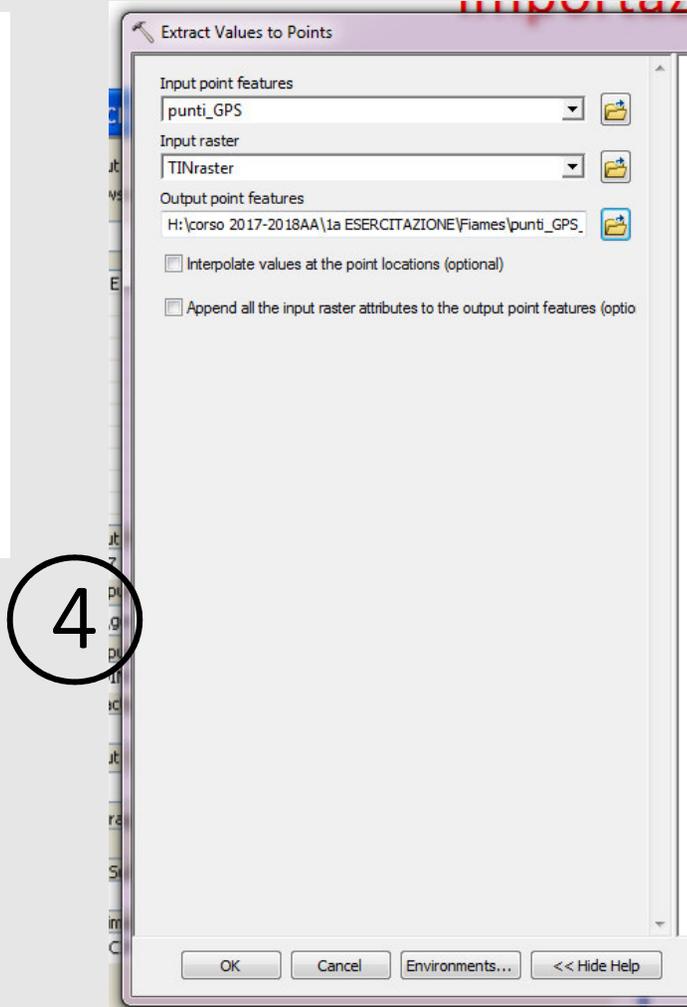
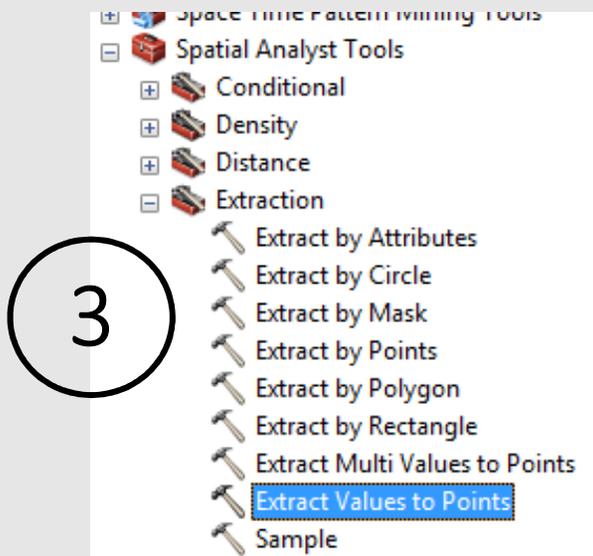
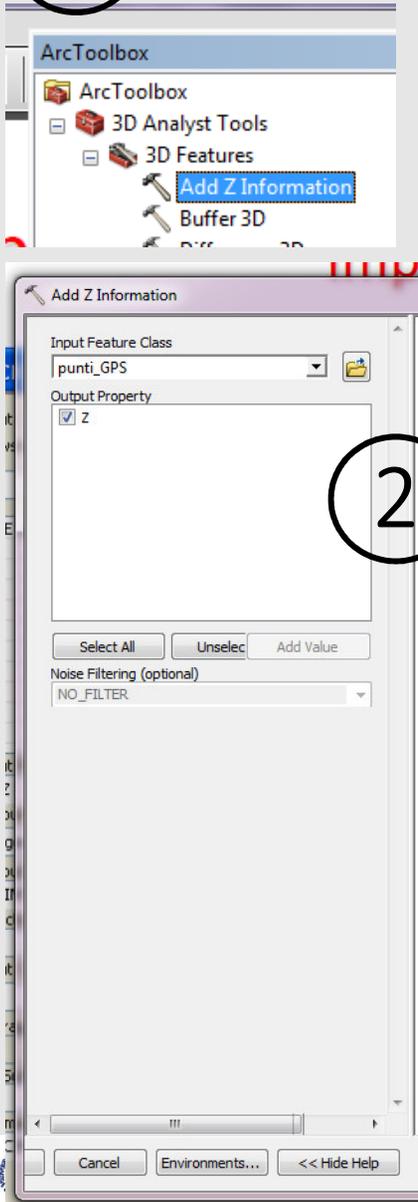
1



2



① Come assegnare le quote del DTM ai punti di controllo



Esporto la tabella in .dbf

The screenshot displays the ArcGIS interface with a topographic map and several black square points. The 'Table' window is open, showing a table with the following data:

FID	Shape *	Id	Z	EASTERVALU
0	Point ZM	0	1404.75	1404.682861
1	Point ZM	0	1453.7	1452.536743
2	Point ZM	0	1458.82	1459.42041
3	Point ZM	0	1433.08	1432.490845
4	Point ZM	0	1392.75	1393.21814
5	Point ZM	0	1371.85	1371.866089
6	Point ZM	0	1413.32	1413.198853
7	Point ZM	0	1429.08	1428.272827
8	Point ZM	0	1464.61	1463.317139
9	Point ZM	0	1457.5	1455.868652
10	Point ZM	0	1410.44	1410.00244
11	Point ZM	0	1454.68	1454.63769

The 'Export Data' dialog is open, showing the following options:

- Export: All records
- Use the same coordinate system as:
 - this layer's source data
 - the data frame
 - the feature dataset you export the data into (only applies if you export to a feature dataset in a geodatabase)
- Output table: H:\CHIARA\00_RICERCA\Articoli_Chia\in lavoro\Water resources\

The 'Saving Data' dialog is also open, showing the following options:

- Look in: Fiames
- Name: Punti_comparison.dbf
- Save as type: dBASE Table

Analisi di accuratezza verticale

The screenshot shows a Windows File Explorer window titled 'Apri' (Open) with the path 'corso 2017-2018AA > 1a ESERCITAZIONE > Fiames'. The file list includes folders like 'info', 'tin', 'tinraster', 'tinrastern' and files like 'point.dbf', 'point_Fiames.dbf', 'Punti_comparison.dbf', 'punti_GPS.dbf', and 'punti_GPS_DTM.dbf'. The file 'Punti_comparison.dbf' is selected.

	B	C	D	E
Z		RASTERVALU	Differenza	
	1404.750000000000	1404.68286133000	0.06713867000	
	1453.700000000000	1452.53674316000	1.16325684000	
	1458.820000000000	1459.42041016000	-0.60041016000	
	1433.080000000000	1432.49084473000	0.58915527000	
	1392.750000000000	1393.21813965000	-0.46813965000	
	1371.850000000000	1371.86608887000	-0.01608887000	
	1413.320000000000	1413.19885254000	0.12114746000	
	1429.080000000000	1428.27282715000	0.80717285000	
	1464.610000000000	1463.31713867000	1.29286133000	
	1457.500000000000	1455.86865234000	1.63134766000	
	1410.440000000000	1410.00244141000	0.43755859000	
	1454.880000000000	1454.63269043000	0.24730957000	