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Georeferencing

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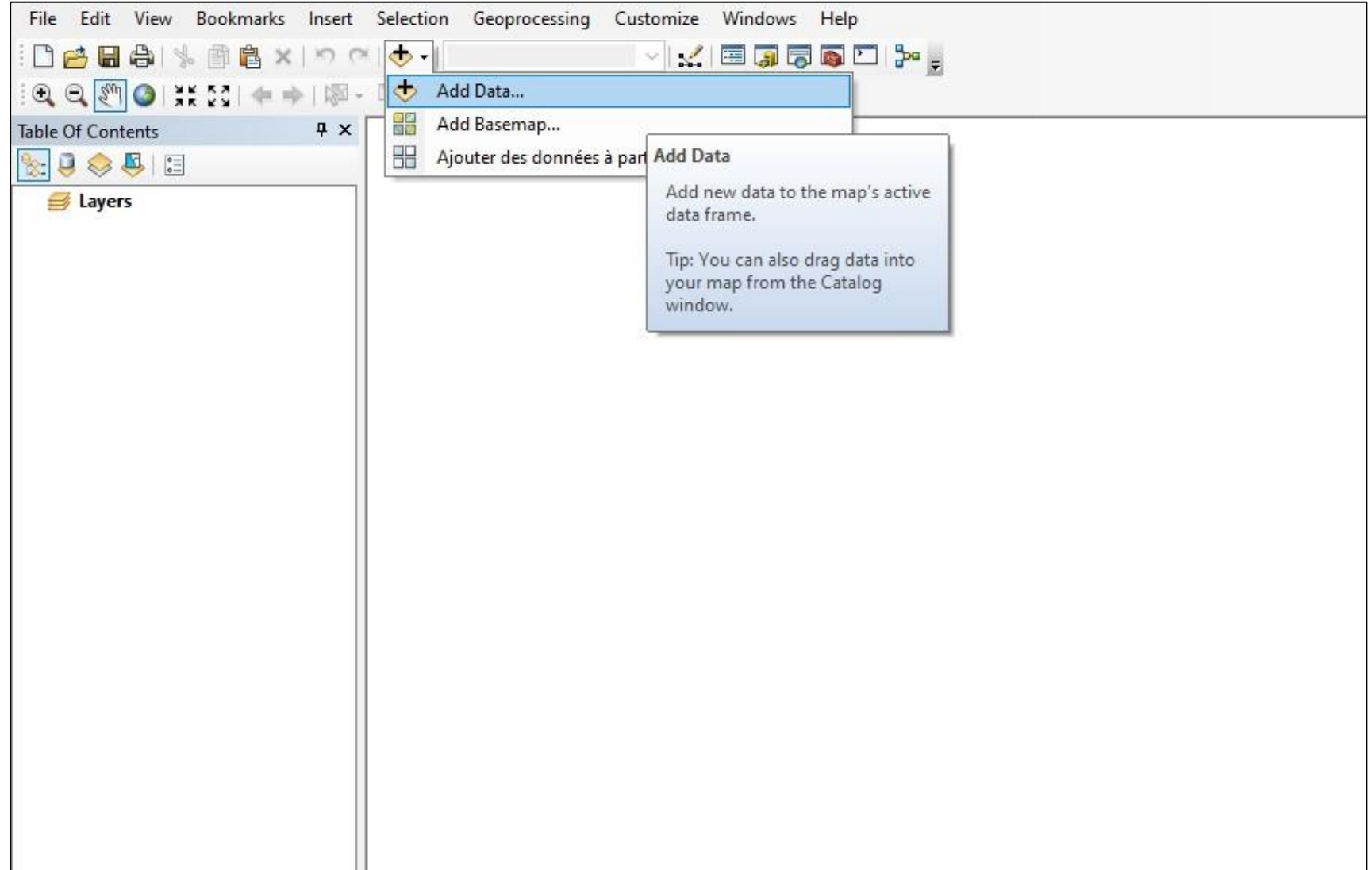
Georeferencing

Georeferencing is distinct from mapping as an academic crowdsourcing task. Whereas mapping refers to the creation of new geographic data (as do users of OSM), georeferencing is the process of adding accurate world-grid coordinates to content that already exists. In most of the cases identified by Dunn and Hedges (2012), Raster data is commonly obtained by scanning maps or collecting aerial photographs and satellite images. Scanned map datasets don't normally contain spatial reference information (either embedded in the file or as a separate file). With aerial photography and satellite imagery, sometimes the location information delivered with the imagery is inadequate, and the data does not align properly with other data you have. Thus, to use some raster datasets in conjunction with your other spatial data, you may need to align or georeference them to a map coordinate system. A map coordinate system is defined using a map projection (a method by which the curved surface of the earth is portrayed on a flat surface).

Georeferencing -ArcMap

1 / Add Data

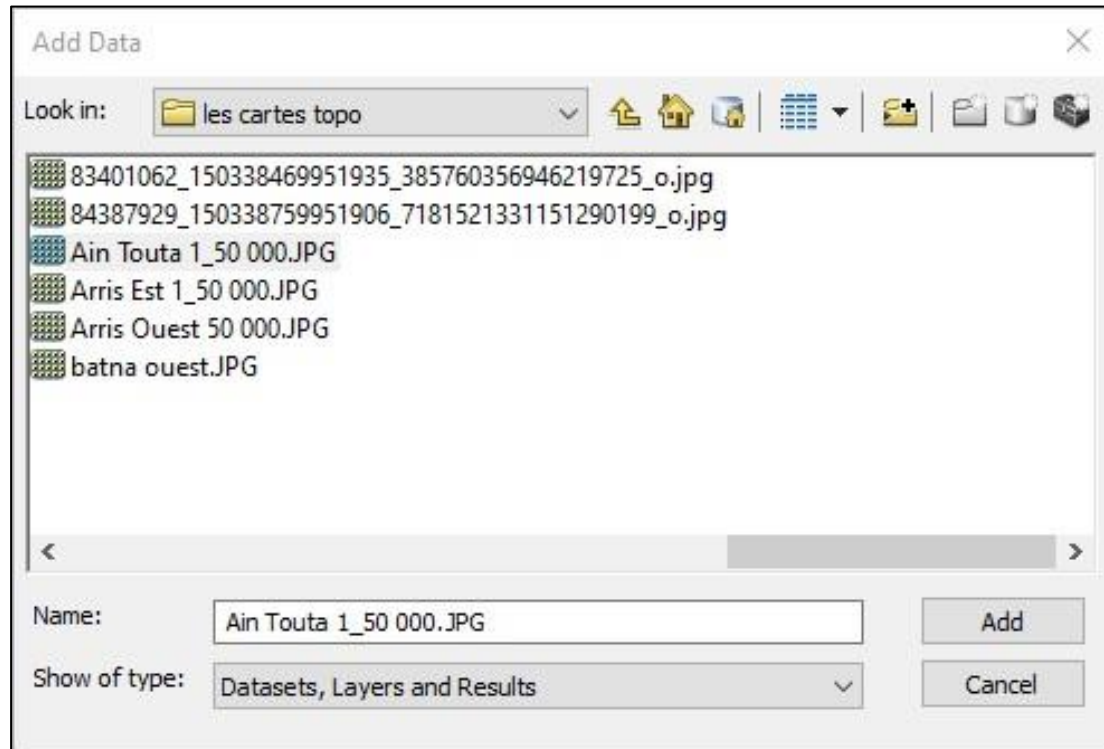
To add data click the **Add Data** as shown in the following figure:



Georeferencing -ArcMap

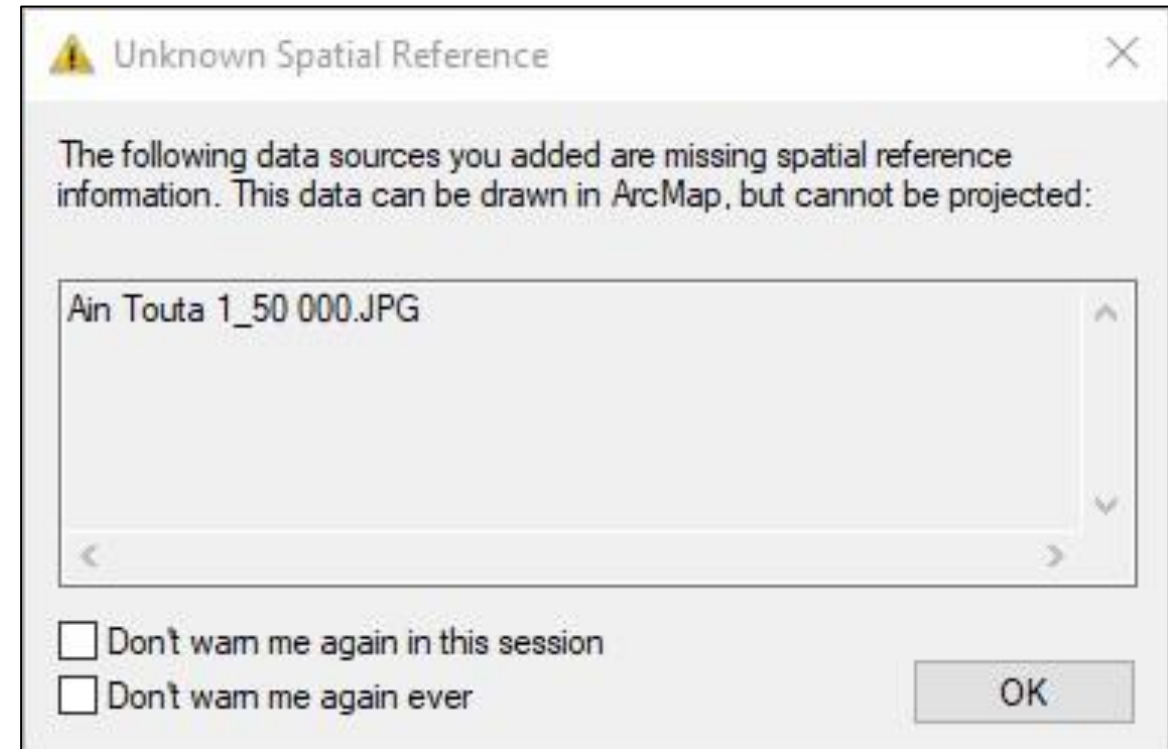
Choose a Raster Data by a map that we want to georeference it

Click **OK**

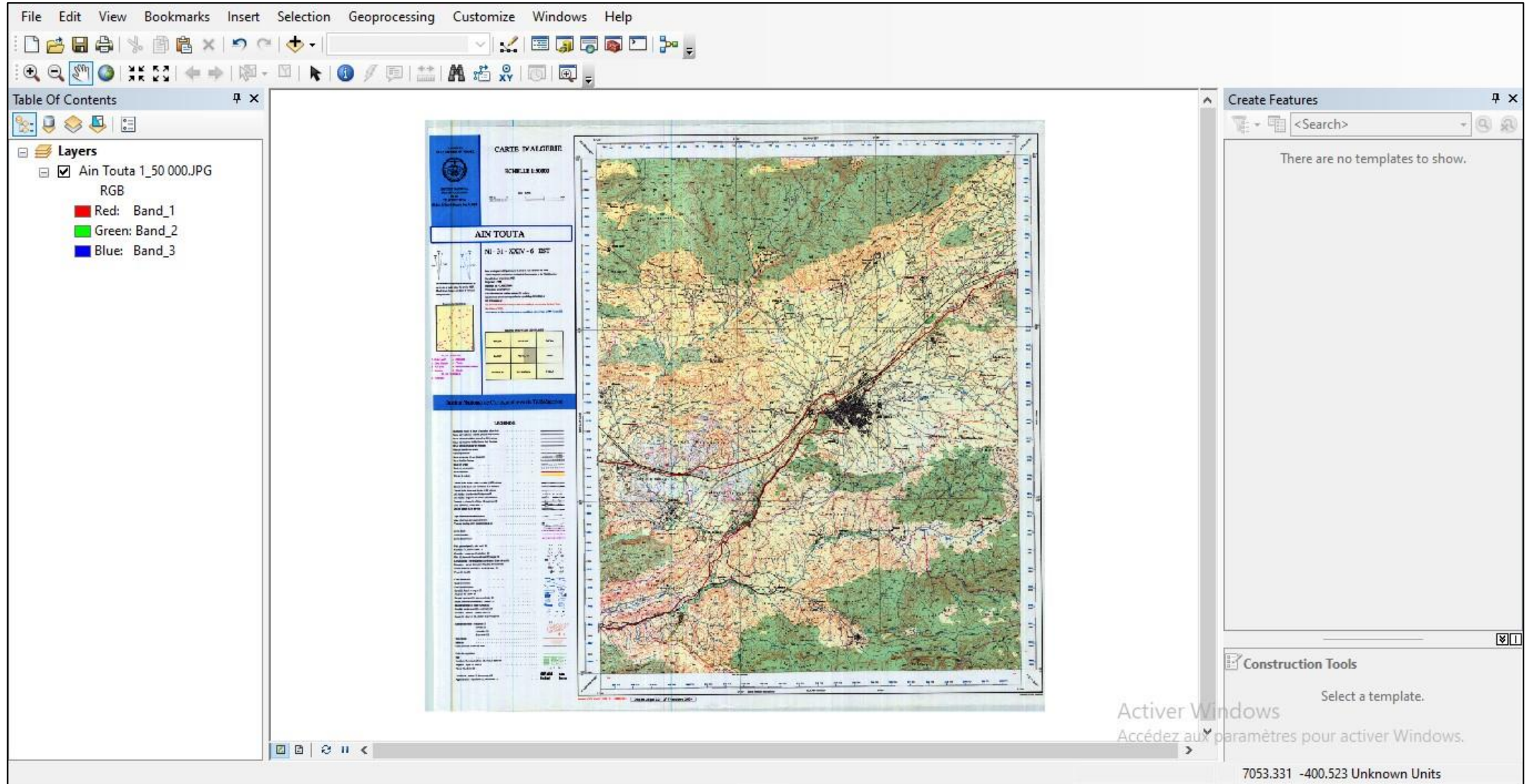


The following window appears

Click **OK**



Georeferencing -ArcMap



Georeferencing -ArcMap

2 /Georeferencing toolbar

The **Georeferencing toolbar** allows you to georeference raster datasets, raster layers (which may have raster functions), image services, and raster products.

To display the **Georeferencing toolbar**, click **Customize > Toolbars**, and click **Georeferencing**.

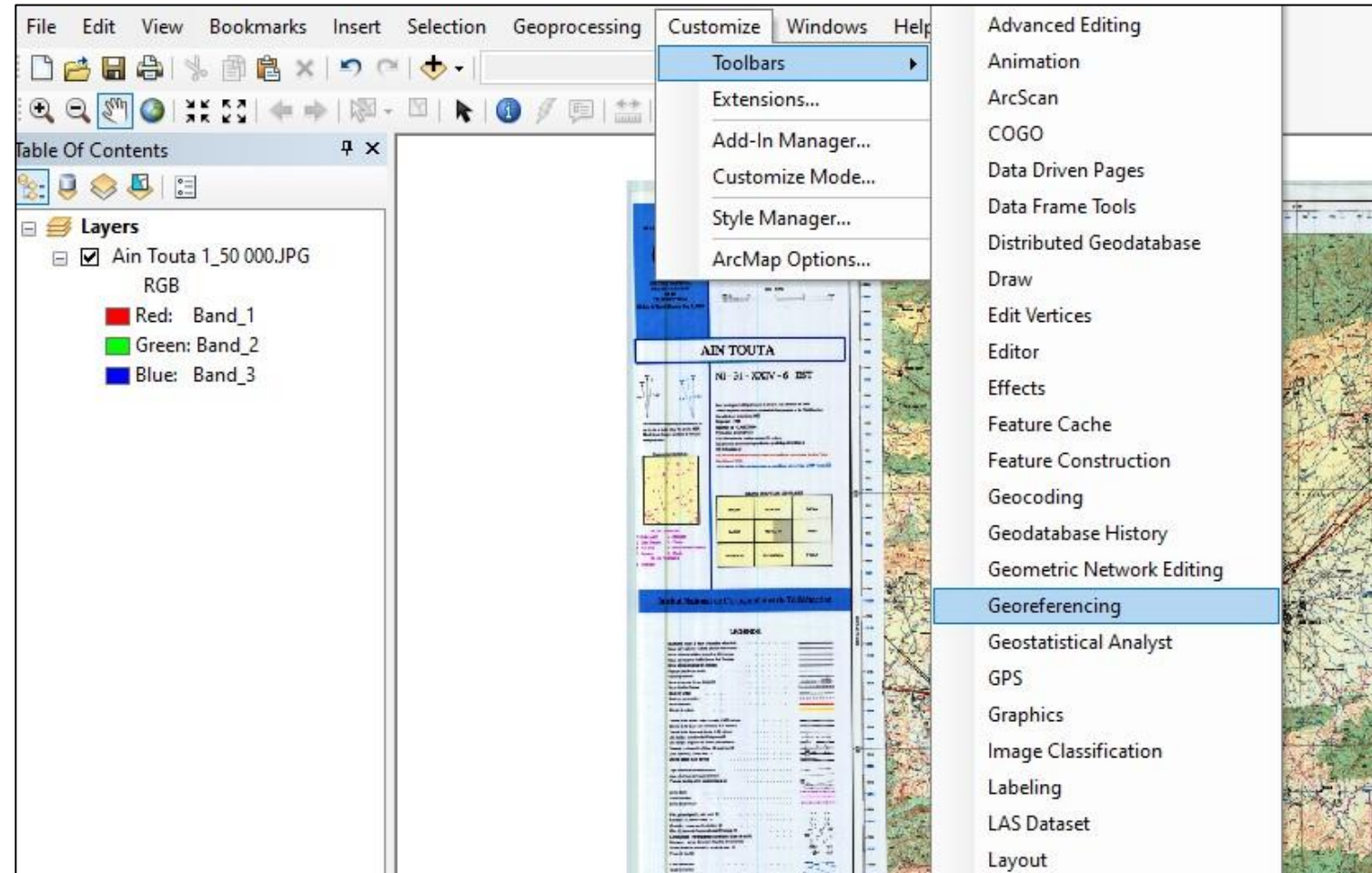


Fig: Georeferencing toolbar

Georeferencing -ArcMap

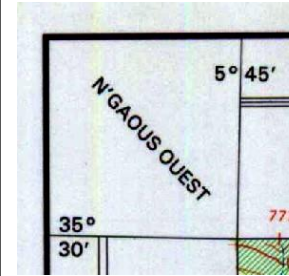
3 / Add control point:

The process involves identifying a series of ground control points known x,y coordinates that link locations on the raster dataset with locations in the spatially referenced data (target data). Control points are locations that can be accurately identified on the raster dataset and in real-world coordinates.

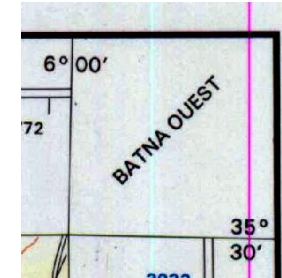
The coordinate x,y will be Decimal Degree

To calculate decimal degrees, we use the DMS to decimal degree formula below:

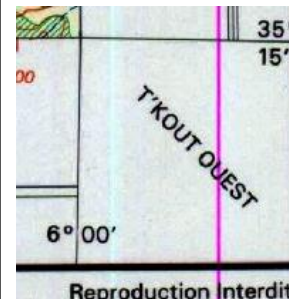
$$\text{Decimal Degrees} = \text{Degrees} + (\text{Minutes}/60) + (\text{Seconds}/3600)$$



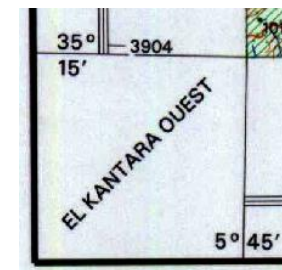
$$\begin{aligned} X1 &= 5 + (45/60) + (00/3600) \\ Y1 &= 35 + (30/60) + (00/3600) \\ P1 &= (5.75, 35.5) \end{aligned}$$



$$\begin{aligned} X2 &= 6 + (00/60) + (00/3600) \\ Y2 &= 35 + (30/60) + (00/3600) \\ P2 &= (6.00, 35.5) \end{aligned}$$



$$\begin{aligned} X3 &= 6 + (00/60) + (00/3600) \\ Y3 &= 35 + (15/60) + (00/3600) \\ P3 &= (6.00, 35.25) \end{aligned}$$

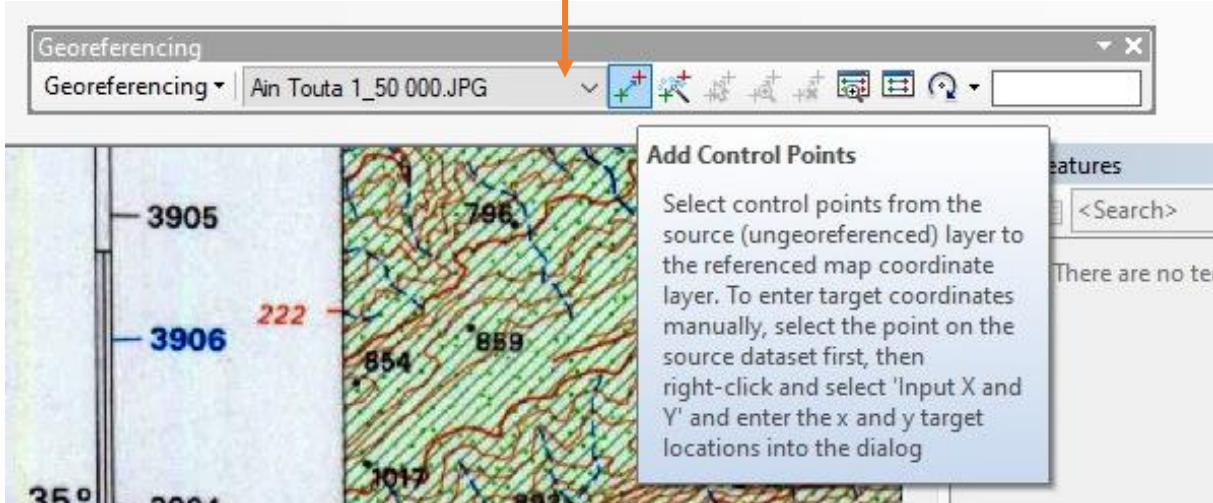


$$\begin{aligned} X4 &= 5 + (45/60) + (00/3600) \\ Y4 &= 35 + (15/60) + (00/3600) \\ P4 &= (5.75, 35.25) \end{aligned}$$

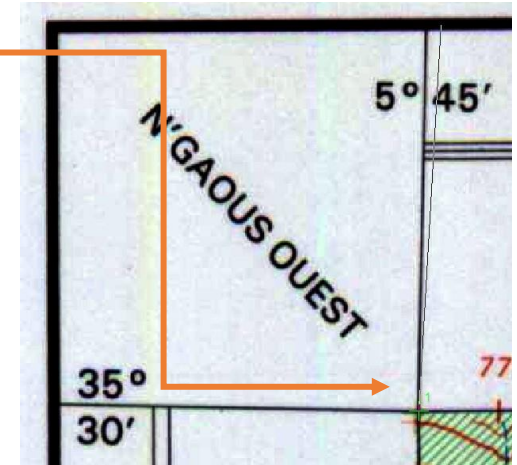
Georeferencing -ArcMap

3 / Add control point:

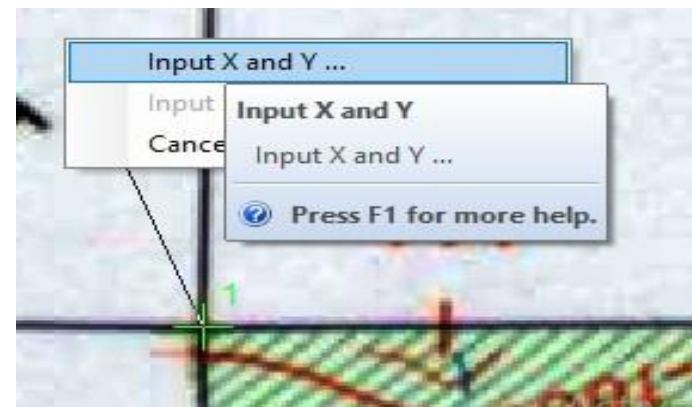
1. Click Add Control Point



2. Click on the first point

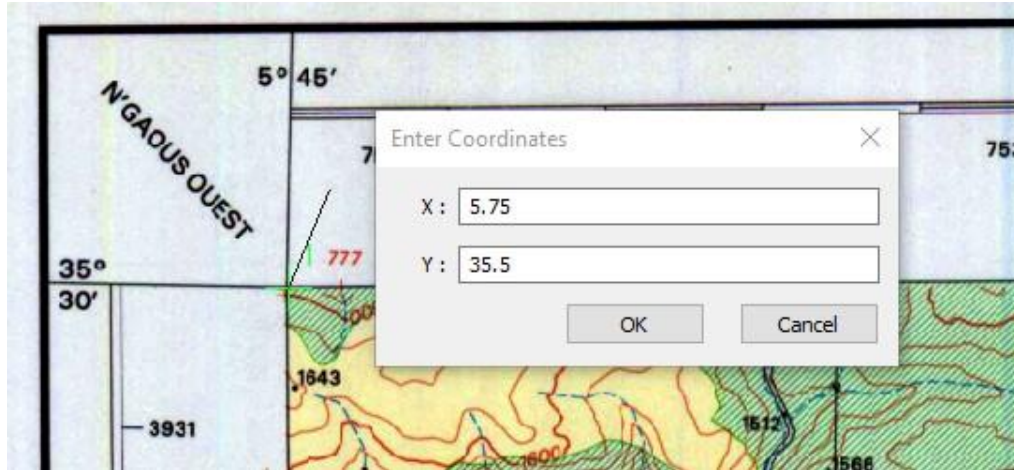


3. Click right then click input X and Y

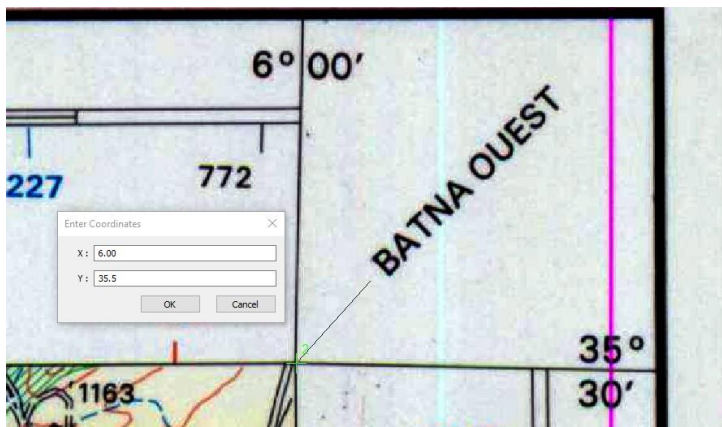


Georeferencing -ArcMap

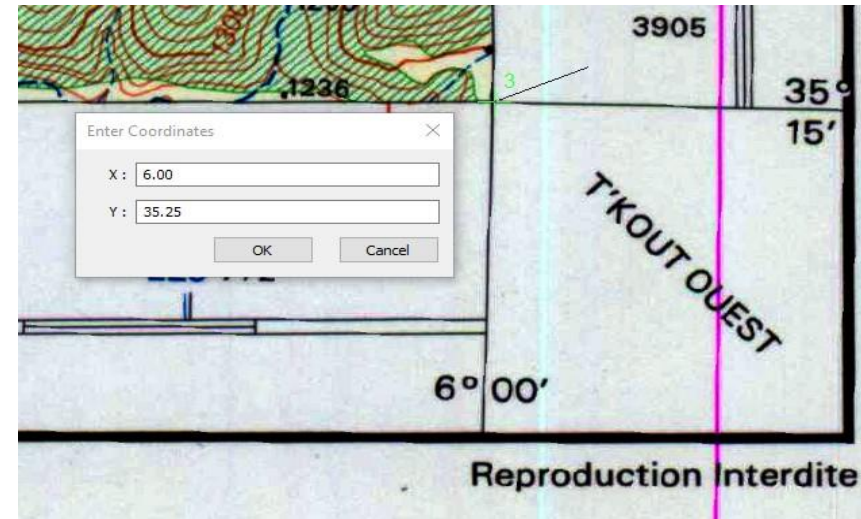
4.Add X and Y for each point



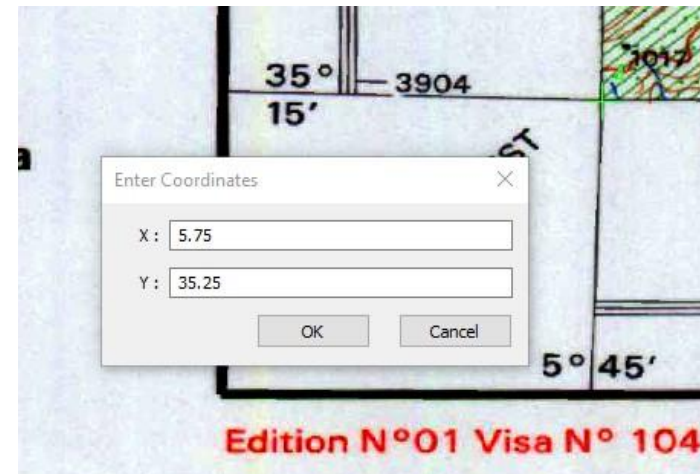
The first point



The second point



The third point

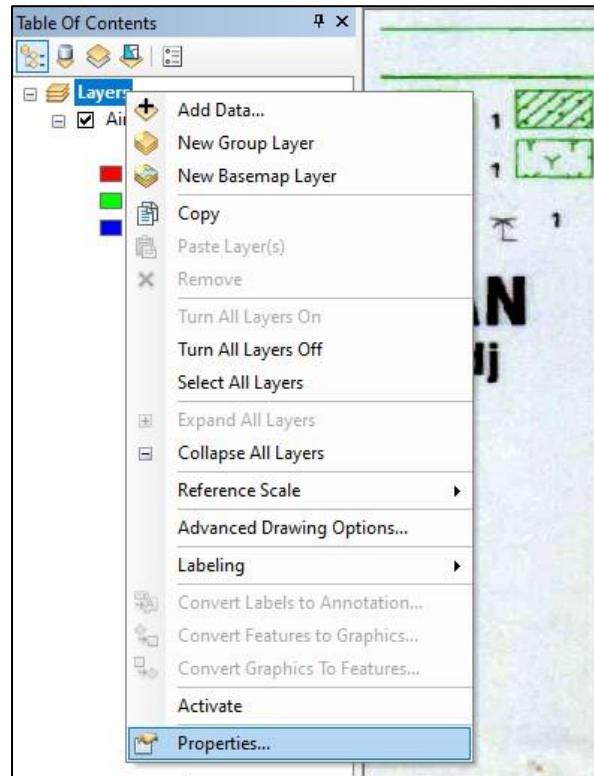


The fourth point

Georeferencing -ArcMap

4 / Project system

Layers > Propriétés > Projected coordinate systems > UTM > WGS 1984 > Northern Hemisphere > WGS 1984 UTM Zone 32



4 / Update Georeferencing

Click *Georeferencing > Update Georeferencing* to save the transformation information with the raster dataset. This creates a new file with the same name as the raster dataset, but with an AUX file extension.

