

Geog 363 – Lab 4 – Georeference

Aaron Marks – Section 2

Question 1. What is the coordinate system of the DRG?

The DRG uses the NAD 1927 UTM Zone 18N coordinate system, which is a Transverse Mercator projection

Question 2. The aerial photographs we are using from the PennPilot website are not Orthorectified. What impact does this have on the georeferencing process?

Non Orthorectified images, such as the ones used, have not been geometrically corrected to correct the scale across the image. The images are slightly distorted due to elevation variation being projected onto a plane.

Question 3. Open ArcCatalog and look at the spatial metadata for your aerial photograph. What is the coordinate system?

Projected coordinate system name: NAD_1927_UTM_Zone_18N
Geographic coordinate system name: GCS_North_American_1927

Question 5. What other features could be digitized from this aerial photograph using polygons? Using lines? Using points? Give an example of each of these three types.

Polygons could be used to digitize other areas such as state game lands, other wooded areas, and bodies of water. The campus could be its own polygon too. It is even possible that building footprints can be made into polygons. Roads and water ways can be represented with lines, maybe even walk ways if desired. Points of interest, building centers, or anything worth labeling may have a point associated with their location.

Question 6. Examine the air photo of State College in 1938 and the USGS topographic quad. What are 4 features that are different between these two images?

Due to these two images being created at different times, and probably not from the same source, there are multiple differences between them. Newer roads can be seen on the topographic quad images that were not there in 1938 when the air photo was taken. The land use has changed significantly; there are now housing developments where there were once farms. The campus was much smaller with fewer buildings in 1938. Area footprints such as the state college polygon that was generated from the 1938 image have grown and have new boundaries.

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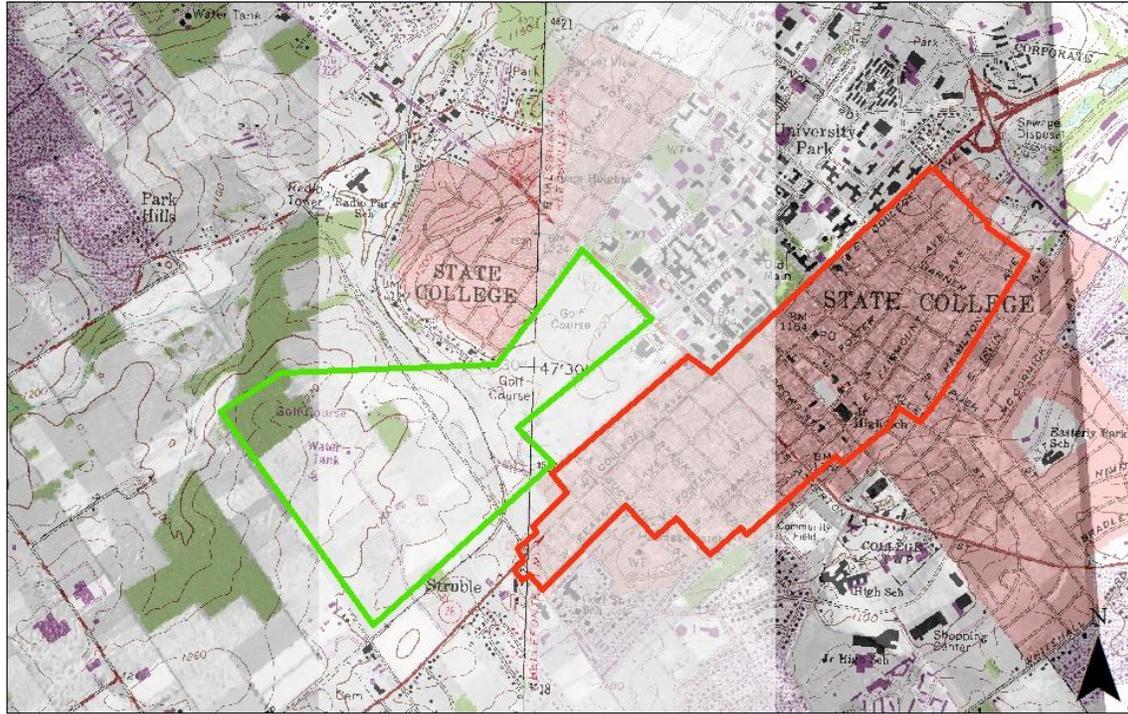
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Geog 363 – Lab 4 – Images

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Digitized Map:

Digitized Map of State College



0 0.2 0.4 0.8 Miles

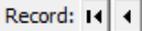
Areas	
	State College
	Golf Course

Sources: Air Photo - Penn Pilot (pennpilot.psu.edu)
Base Map - PASDA (maps.pasda.psu.edu)

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Attribute Table:

Attributes of SCArea1938			
FID	Shape *	Id	Locale
0	Polyline	1	State College
1	Polyline	2	Golf Course

Record:  2  Show: Records (0 out of 2 Selected)

Link Table:

The screenshot shows a 'Link Table' dialog box with a table containing 15 rows of data. The columns are 'Link', 'X Source', 'Y Source', 'X Map', 'Y Map', and 'Residual'. Below the table, there is a checked 'Auto Adjust' checkbox, a 'Transformation' dropdown menu set to '1st Order Polynomial (A)', and a 'Total RMS Error' field showing '5.66383'. At the bottom, there are buttons for 'Load...', 'Save...', 'Restore From Dataset', and 'OK'.

Link	X Source	Y Source	X Map	Y Map	Residual
1	5762.569056	-4213.007398	258717.704275	4518865.271873	7.20730
2	138.367957	-3189.334012	254964.282123	4519302.681894	3.01329
3	882.369873	-5236.284021	255551.047390	4517989.437798	9.00468
4	3155.320987	-1440.261587	256875.671472	4520569.356571	6.17591
5	1474.391225	-2370.889699	255809.206997	4519899.706215	6.54544
6	1496.163811	-2449.112836	255821.544554	4519838.592268	5.68407
7	2450.568806	-229.860966	256355.369721	4521344.453176	3.74838
8	6899.669212	-2675.489606	259397.216272	4519920.100926	4.57355
9	5766.246193	-2874.927394	258648.872325	4519741.809580	6.26020
10	7252.444443	-5491.776759	259741.651718	4518085.284027	6.17865
11	359.034226	-4293.986079	255153.937859	4518578.371360	5.73881
12	988.782355	-3935.989219	255550.255952	4518842.691666	6.17212
13	4571.520226	-4135.609781	257927.931911	4518862.636481	4.43880
14	5221.797815	-4225.558893	258351.845716	4518829.362242	4.34783
15	5111.937173	-1409.757099	258162.377635	4520677.072029	1.95249

The total RMS Error was 5.66, with none of the Links having a Residual higher than 10. Anything over 10 was deleted and new links were established to lower the total error