Excel files include the raw database and the processed data that led to the quadrat analyses. The "Matrix_raw data" file includes the raw data as downloaded from the server. This data was cleaned and organized for its posterior use. "Quadrat analyzes "file includes all the quadrat analyses resulting in each research question in the paper except question four. Question 4 can be seen in the file "Water analysis_Blaarmeersen." All excel files come with a "CODE" tab that describes each of the codes used, their meaning, and ways that were calculated where necessary. Two zip files include all the GIS files. The first one includes the GIS files from which "Matrix_raw data" was built from. The second folder includes the resulting maps from the quadrat analyses. In order to visualize them as in the paper, configure the symbology tab at the GIS software in quantile and the categories number, as shown in the paper.

The production of the files in the "GIS_Processed data" folder was done via a repetitive line of commands in ArcGIS pro. The same process was followed for each one of the quadrat analysis described in the paper.

Step 1: Create a fishnet with the desired dimension. Each quadrat analysis has its cell dimensions, which are calculated using the formula described in the data analysis section of the paper.

| Quadrat Analysis	Analysis area	Points in area
Ghent	82.44 km²	449
Ghent dynamic	82.44 km²	449
Blaarmeersen	0.8743 km²	56
Citadelpark	0.1511 km²	56

Fields to replace in command "fishnet" Arc GIS Pro for each QA. See the image below when executing the command.

| Output feature class	template extent (GIS Layer)	Location in folder	Cell size width	Cell size height	Geometry type
Ghent 605m	AA_Ghent	GIS_raw data	605 m	605 m	Polygon
Ghent dynamic	AA_Ghent	GIS_raw data	697 m	697 m	Polygon
Blaarmeersen	Blaarmeersen_poly	GIS_raw data	176 m	176 m	Polygon
Citadelpark	Citadelpark	GIS_raw data	73 m	73 m	Polygon
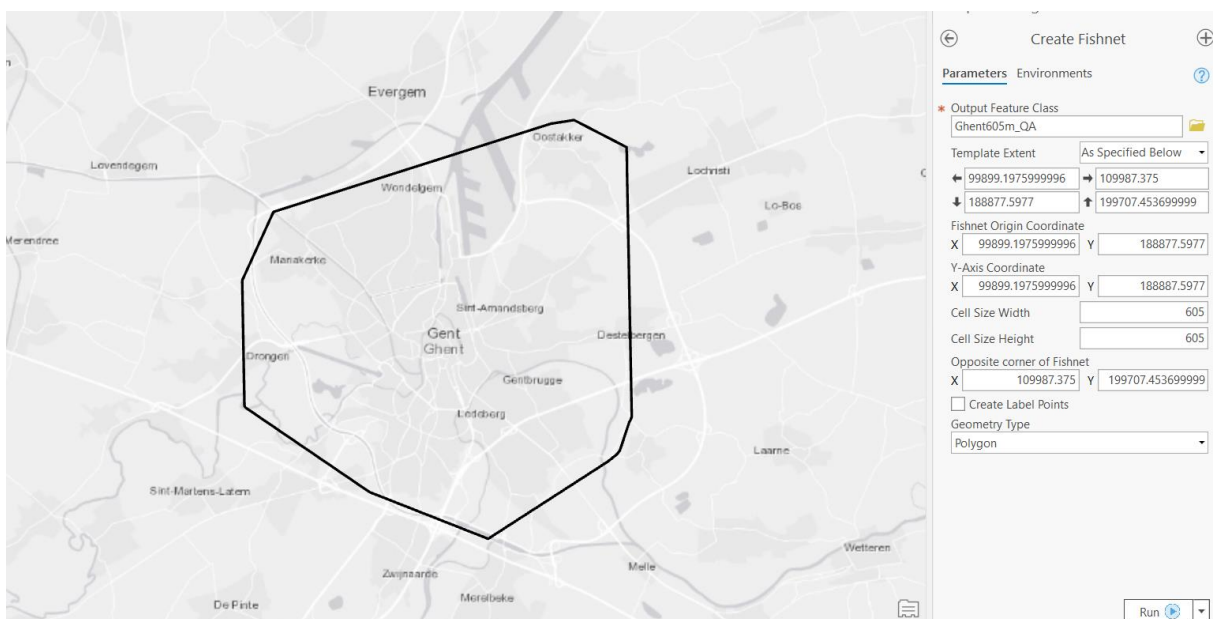
Step 2: Use Spatial join for the fishnet layer and, e.g., the original point layer

- Target features: Respective fishnet
- Join features: Either point, polygon or marker original layers located in GIS_raw data
- Output feature: Name and location of the resulting QA layer
- Join operations: Join one to one
- Match option: intersect
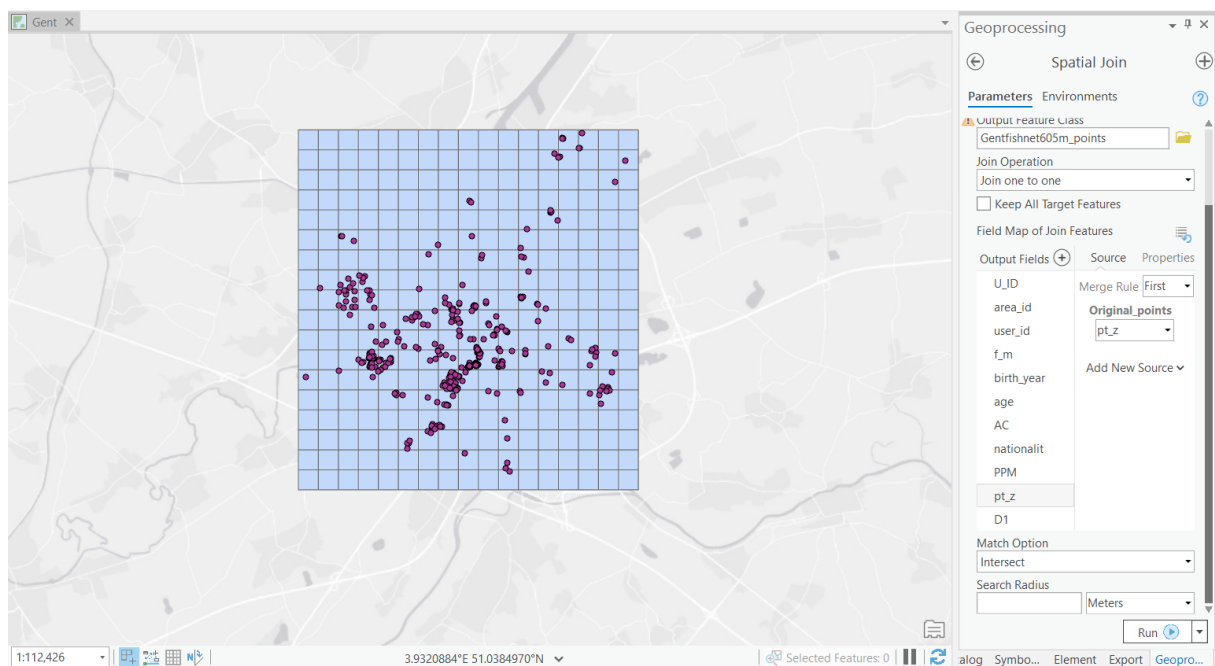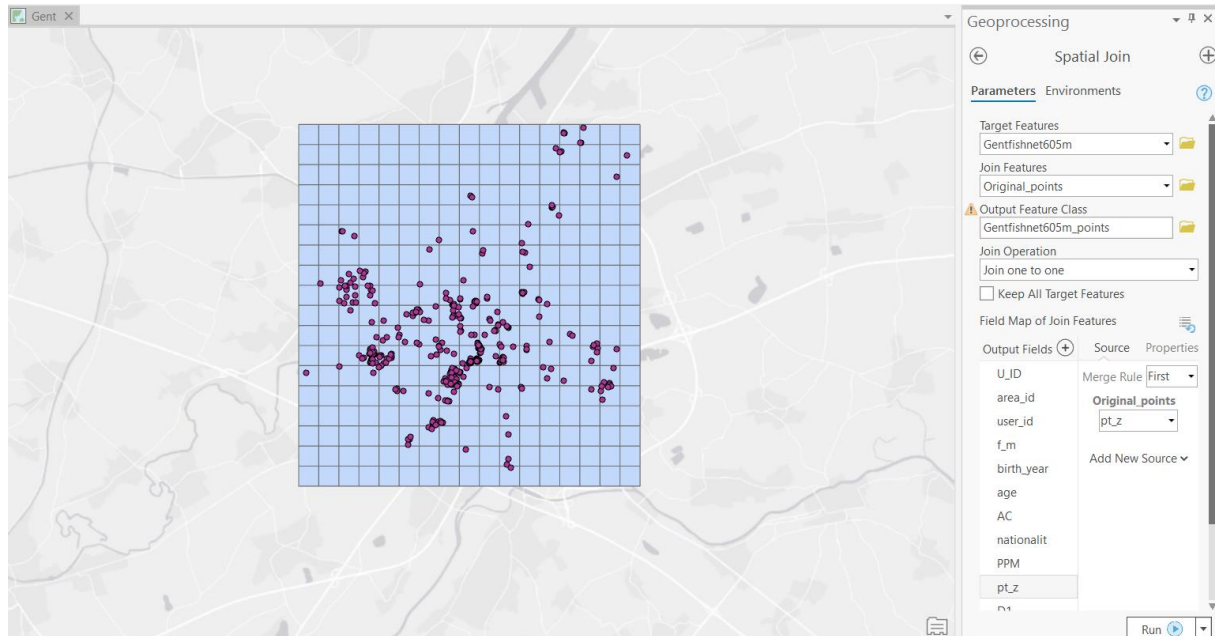
When doing spatial join for the dynamic QA, a special query is applied to filter those points, polygons, and markers that have cero value in the D1 column. After this step, the normal spatial join can be

performed. See image.
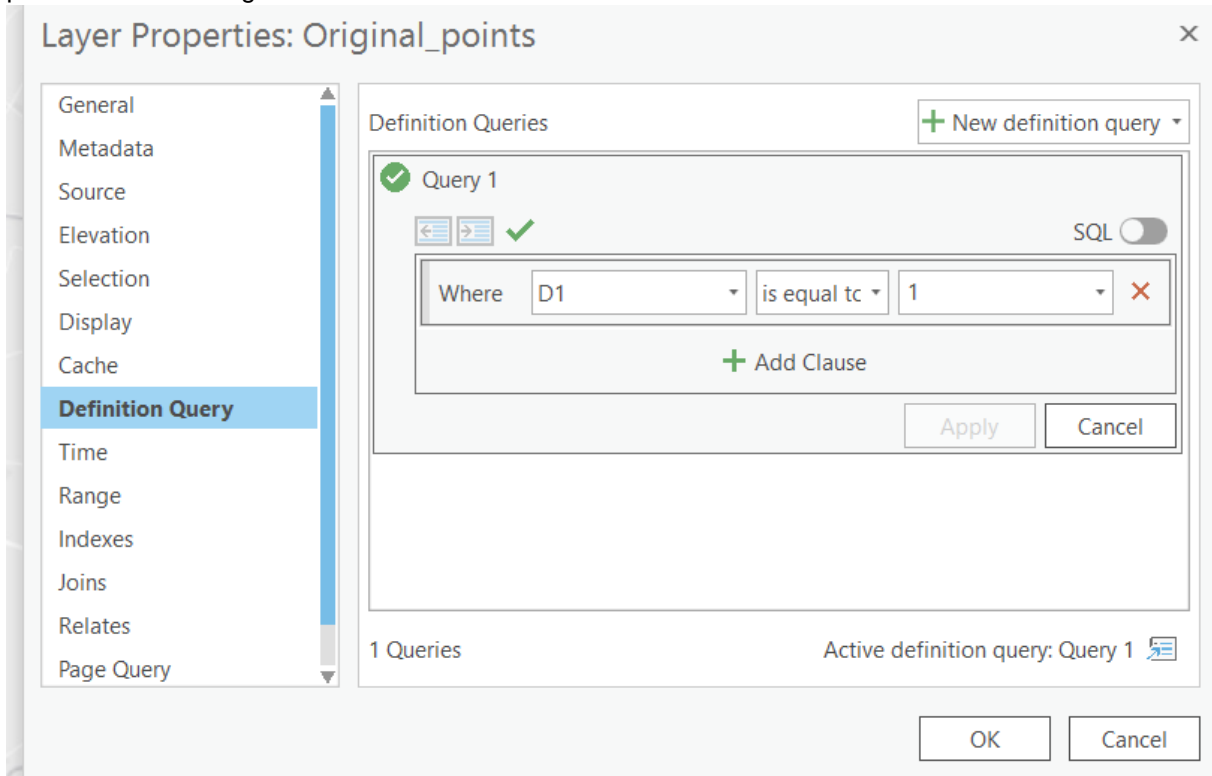
Step 3: Clean layer from absolute zeros

Once the three spatial joins for each quadrat analysis have been done, their respective tables can be exported and compiled in excel, where the absolute zeros will be removed. \To do so, those cells where there are no counts overlaps for any of the points, polygons, or markers can be completely removed. Once done so, this combined table can be imported into Arc and join the original fishnet via "add join."
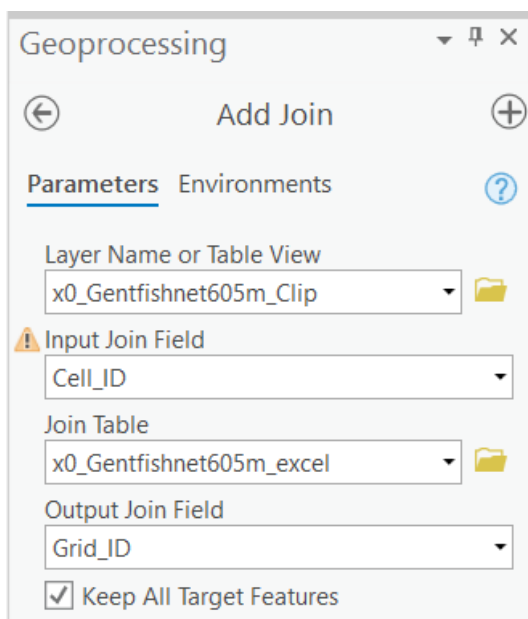

Clip 4: Although many cells will be already gone due to the elimination of the absolute zeros to get a more refined and polished view of the quadrat analysis, we clipped the final fishnet to its respective

analysis area, depending on the quadrat analysis that can be either layer AA_Ghent, Blaarmeersen_poly, Citadelpark or the lake polygon within Blaarmeersen.
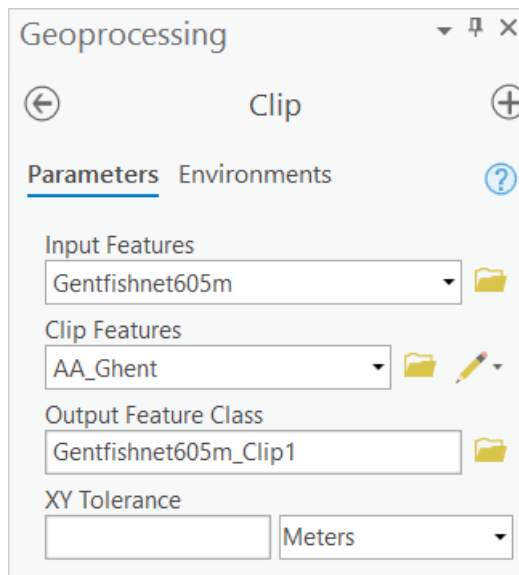
Step 4: Visualize accordingly

Once the final quadrat analysis map has been clipped, the visualization parameters can be input. The following parameters apply for all maps. The only changing parameter is "Classes "which depending on the number of observations, can vary from 3 – 5. See INSEE - National Institute of Statistics and Economic Studies 2018 reference in the paper.
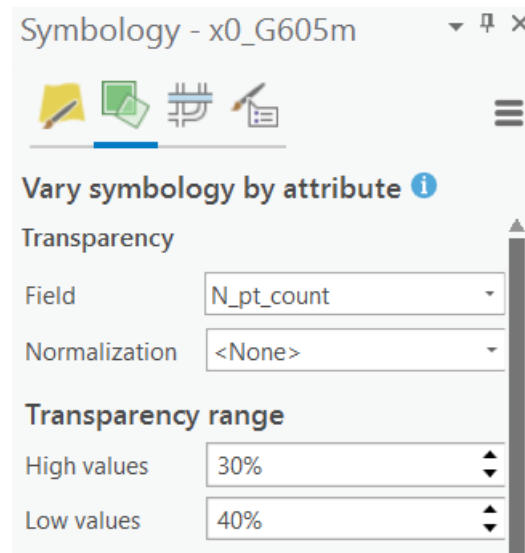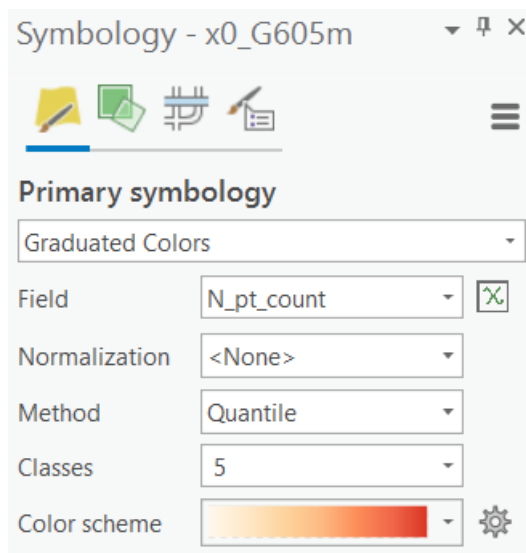
The tables resulting from those merged/compiled maps were imported into STATA software to run simple linear regressions and AIC. For further detail of STATA commands, see the STATA output file.