Summing up and closing down of topic

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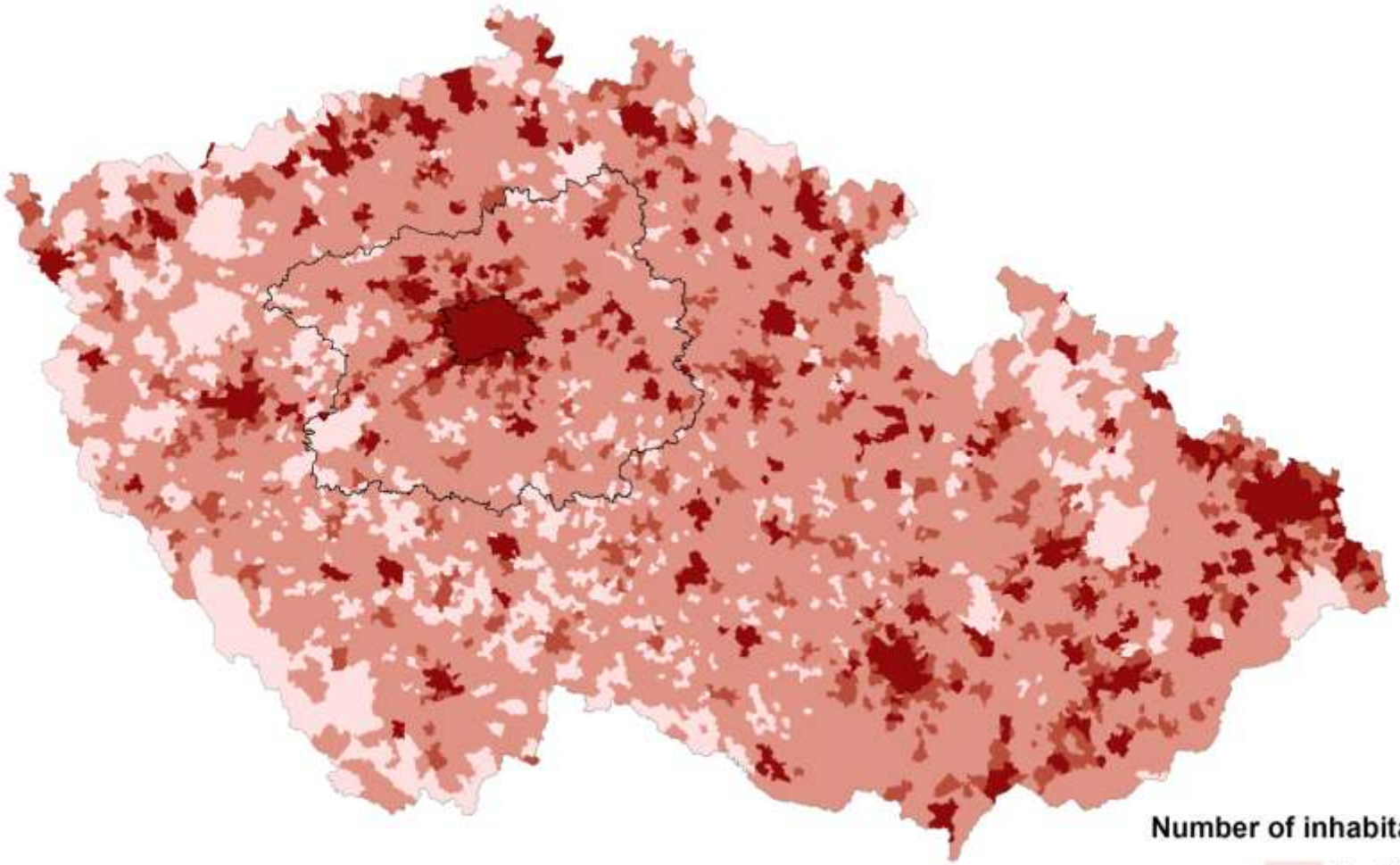
Situation and Circumstances

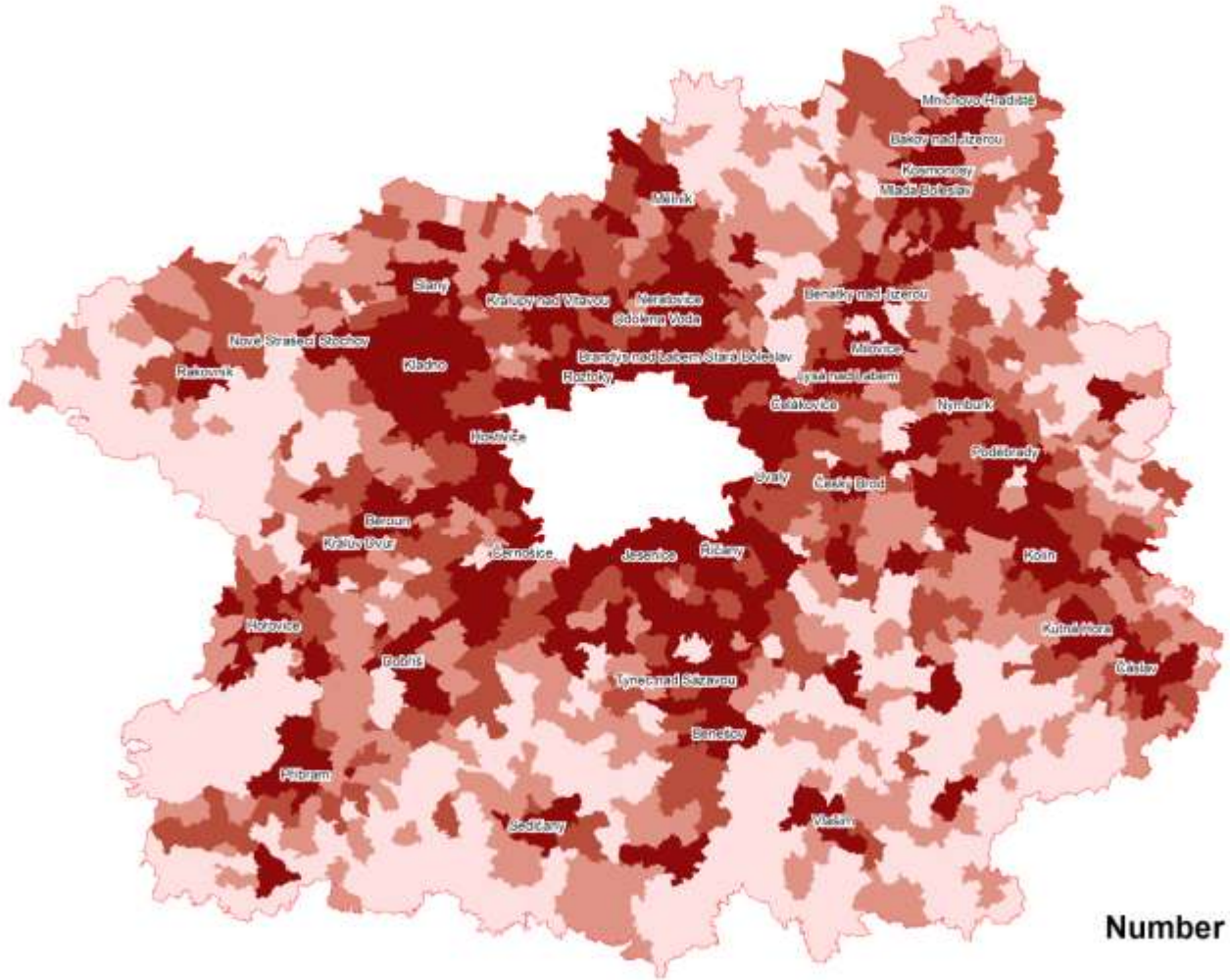
- Population and Housing Censuses create a lot of possibilities for spatial analysis – both for bottom-up *and also* for top-down method
- This presentation demonstrate both method *(as a one of the possible solution)*
- It is based on preliminary results of Population and Housing Census witch was held in Czech Republic in 2011

Population density in according to preliminary results (Census 2011)



Working outputs based on preliminary results (Census 2011)

Population density in according to preliminary results (Census 2011) by municipalities Central Bohemia Region



Number of inhabitans per 1 km2

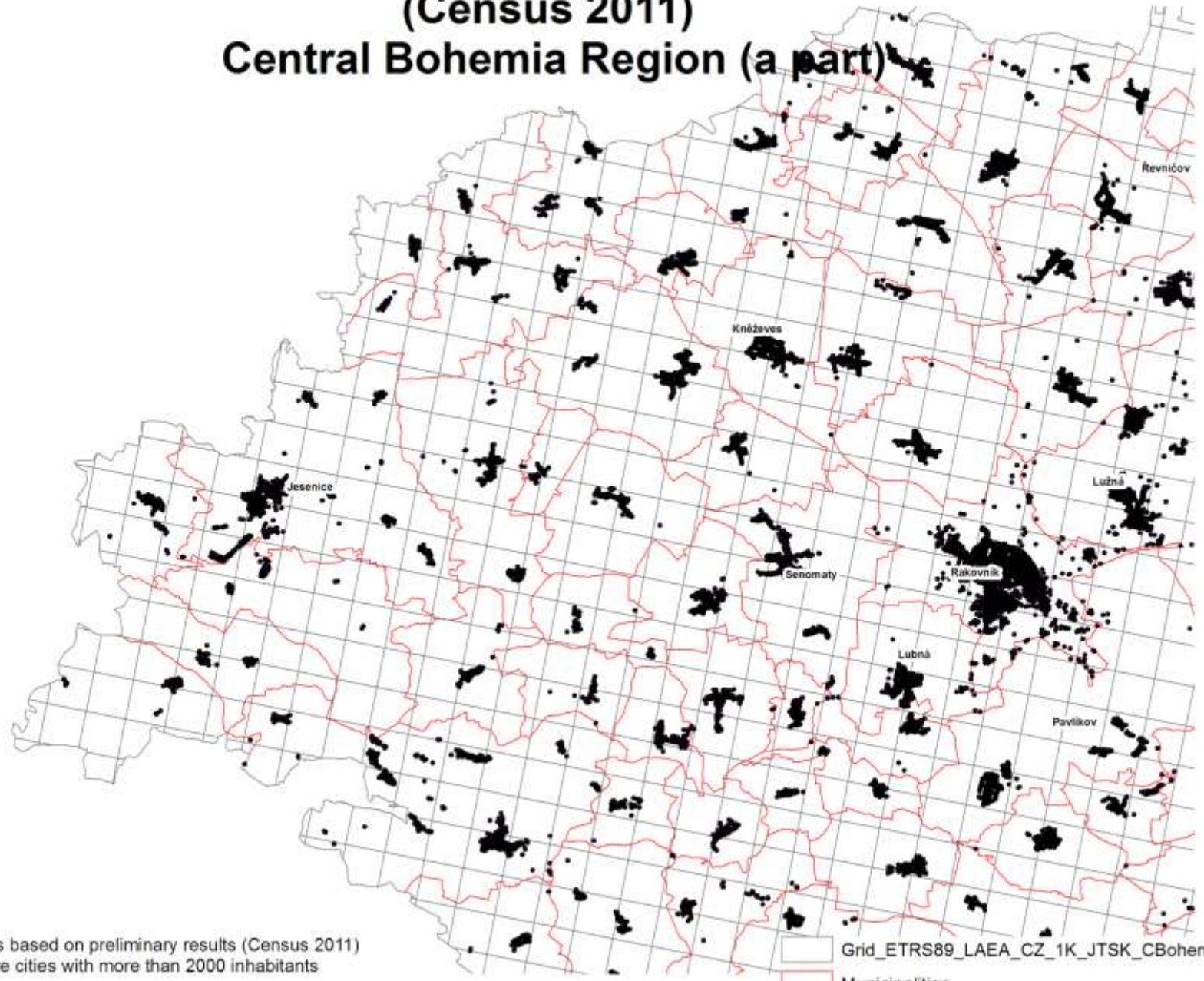
- 0.1 - 35.0
- 35.1 - 60.1
- 60.2 - 117.4
- 117.5 - 1871.6

Working outputs based on preliminary results (Census 2011)
Quartile distribution
Labeled are cities with more than 5000 inhabitants

Bottom-up method

- Is based on exact localisation (x,y coordintates) of houses (e.g.Census 2011)
- There is direct linkage between houses -> dwellings -> inhabitans (population)

Network of grids and georeferenced points of houses (Census 2011) Central Bohemia Region (a part)

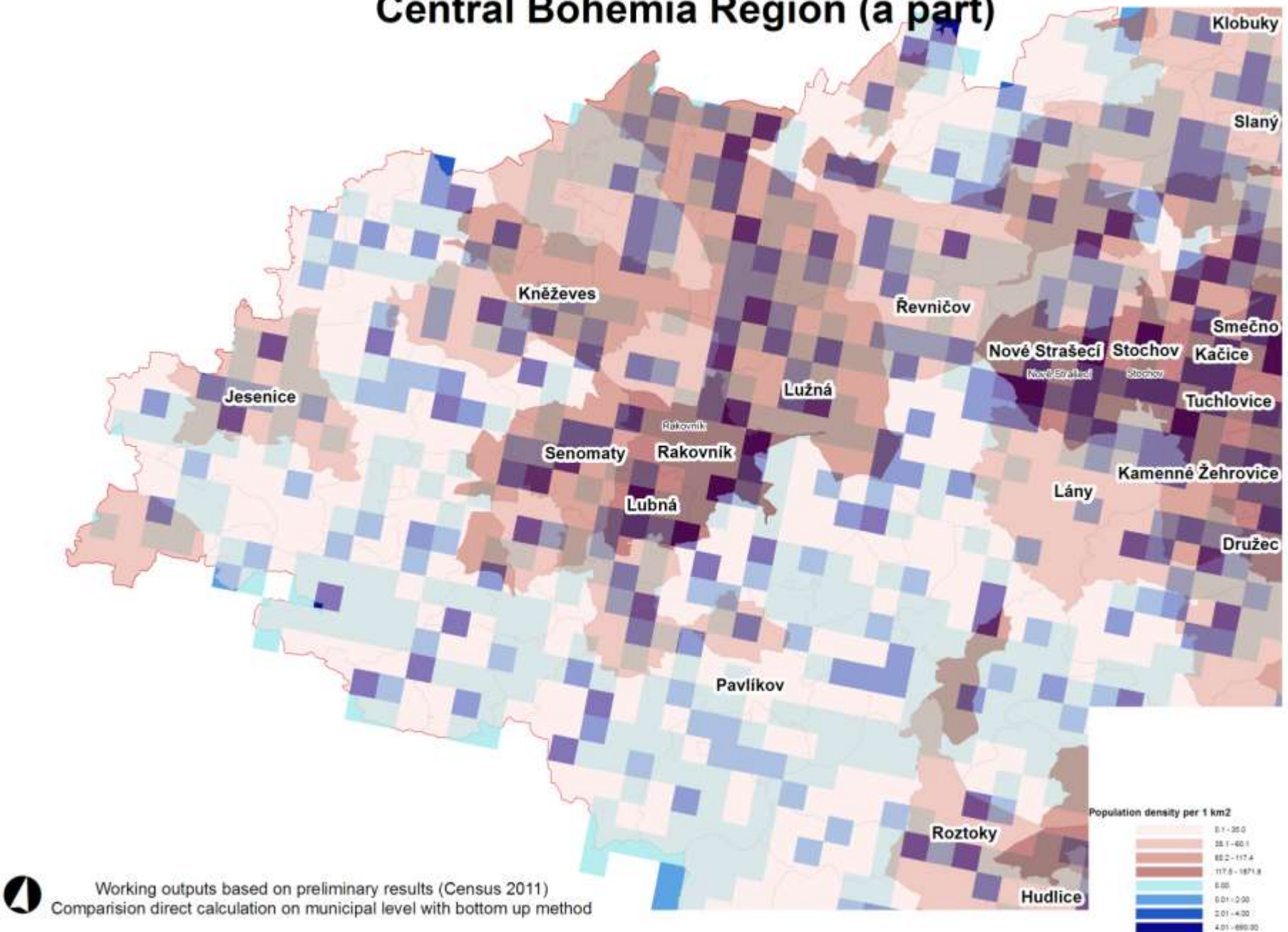


Working outputs based on preliminary results (Census 2011)
Labeled are cities with more than 2000 inhabitants

Grid_ETRS89_LAEA_CZ_1K_JTSK_CBohemia Region

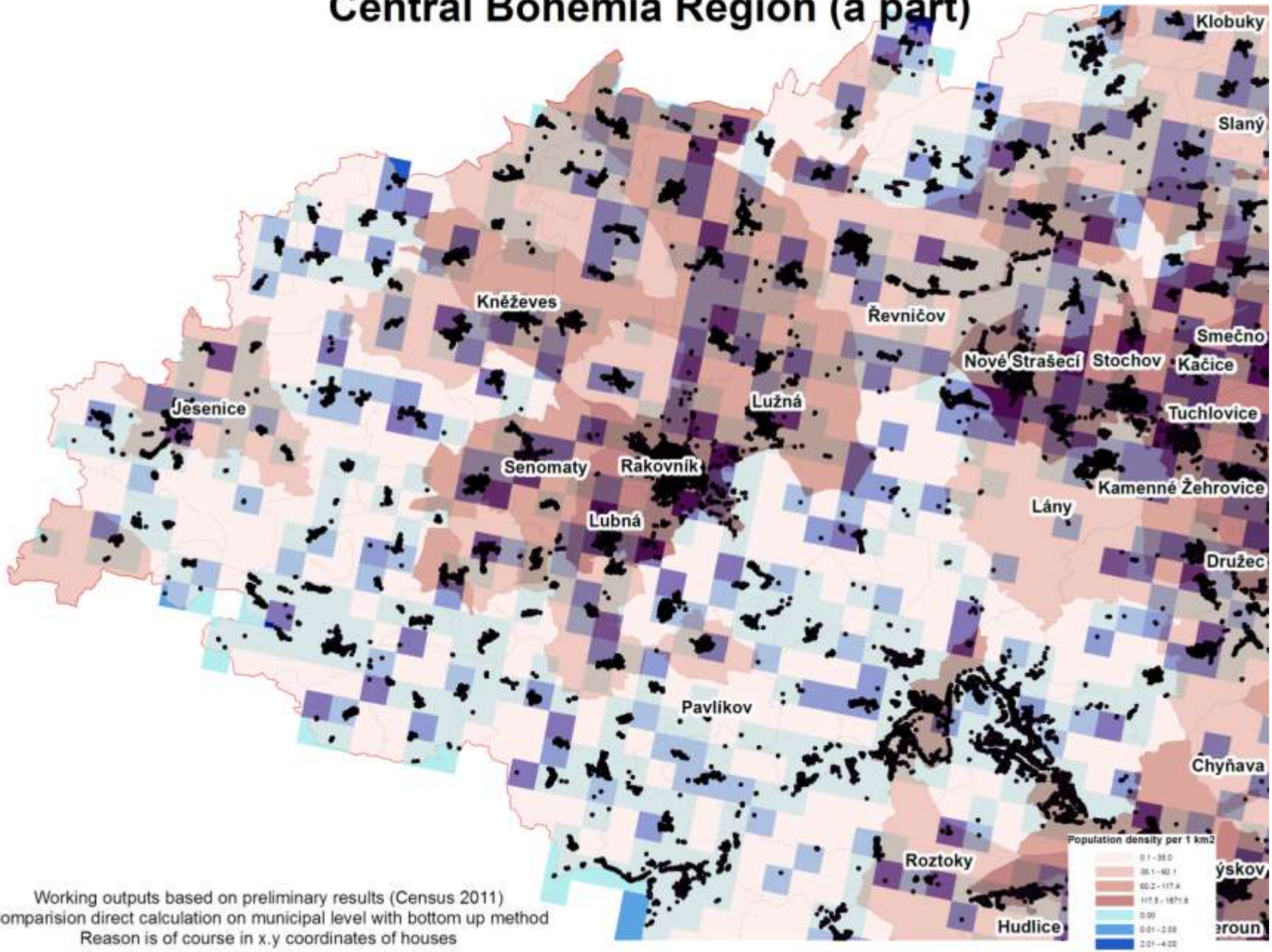
Municipalities

Local differences (Census 2011)
Central Bohemia Region (a part)



Working outputs based on preliminary results (Census 2011)
Comparision direct calculation on municipal level with bottom up method

Local differences (Census 2011)
Central Bohemia Region (a part)

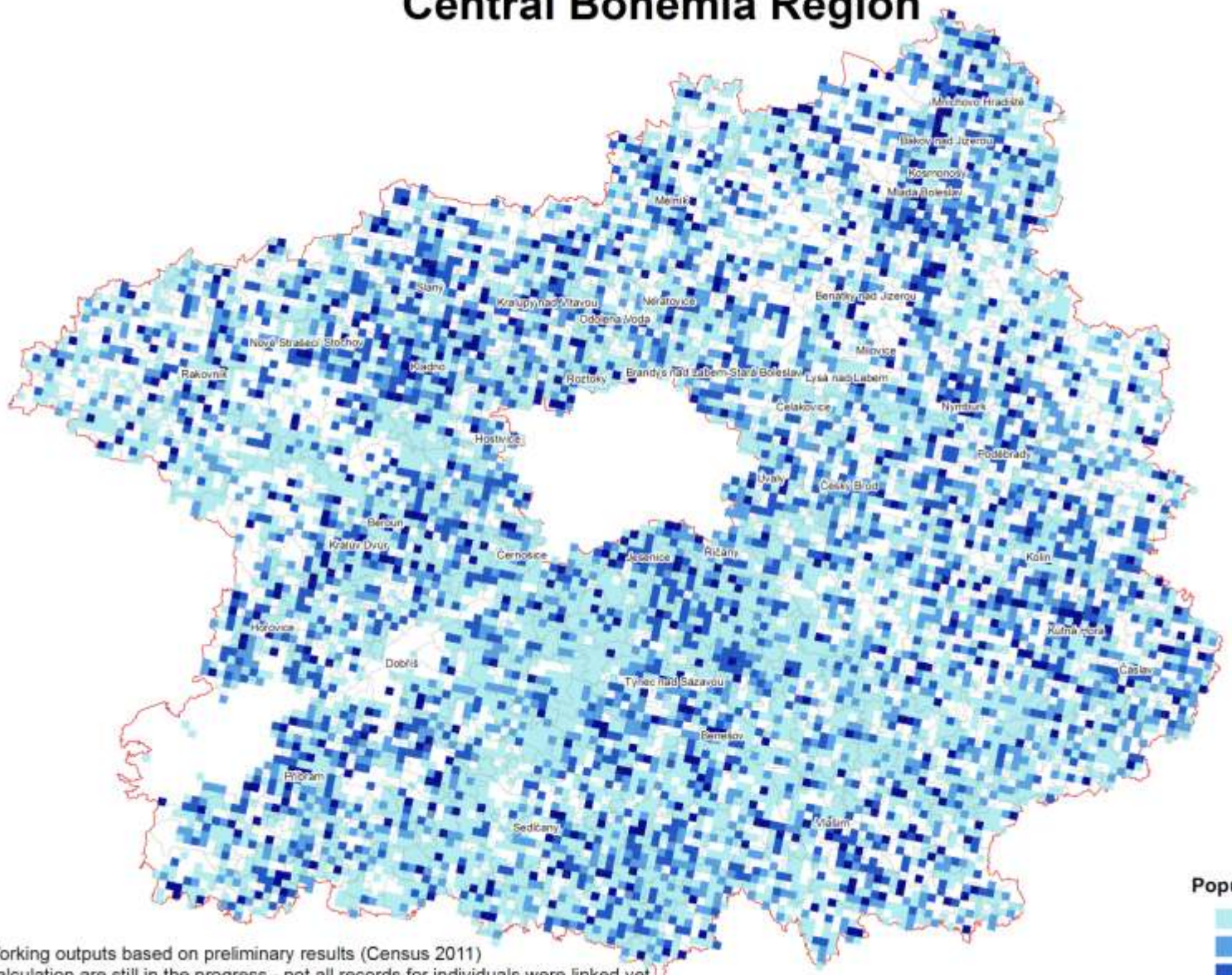


Working outputs based on preliminary results (Census 2011)
Comparision direct calculation on municipal level with bottom up method
Reason is of course in x.y coordinates of houses

Conclusion to bottom-up method

- Using grids give more precise information (in case we have x,y coordinates)

Population density by network of grids (Census 2011)
Central Bohemia Region



Population density

- 0.00
- 0.01 - 2.00
- 2.01 - 4.00
- 4.01 - 690.00

Working outputs based on preliminary results (Census 2011)
Calculation are still in the progress - not all records for individuals were linked yet
Population density (per 1 km2) = number of inhabitans (per 1 km2)
Bottom up method Quartile distribution

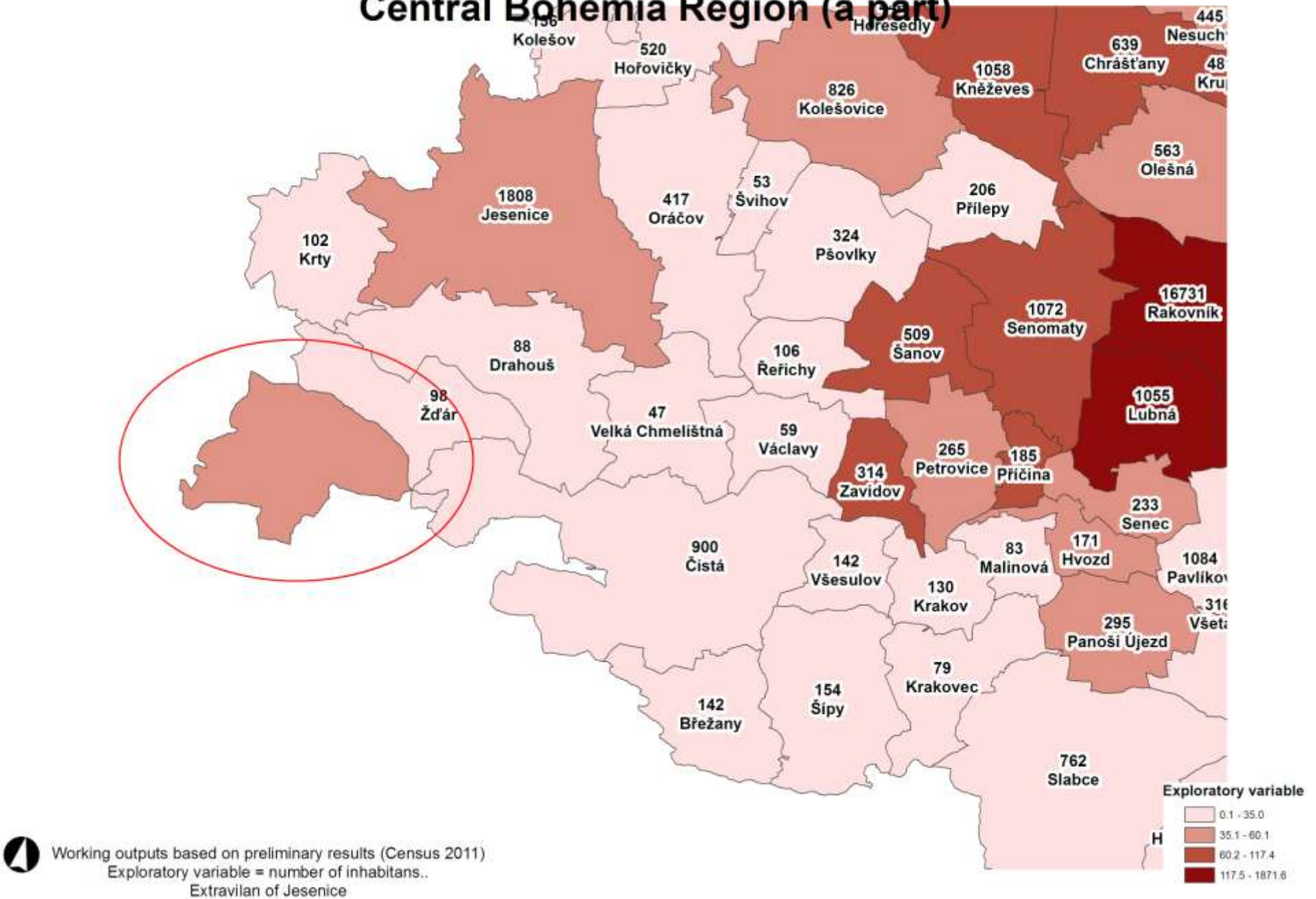
Top-down method

- In some cases we do not have x,y coordinates, but only aggregate information – for example on municipal level
- We have two variables (as a minimum):
  - Exploratory variable
  - Exploining variable

Calculating of weighting - explorative variable

- In following example we use the same census data for modelling and testing solution
- Hypothesis: in theory top-down and botom-up should give the same results but problem of preliminary results is that not ALL data (about persons) are georeferenced

Exploratory variable by municipalities (Census 2011) , Central Bohemia Region (a part)



Working outputs based on preliminary results (Census 2011)
Exploratory variable = number of inhabitans..
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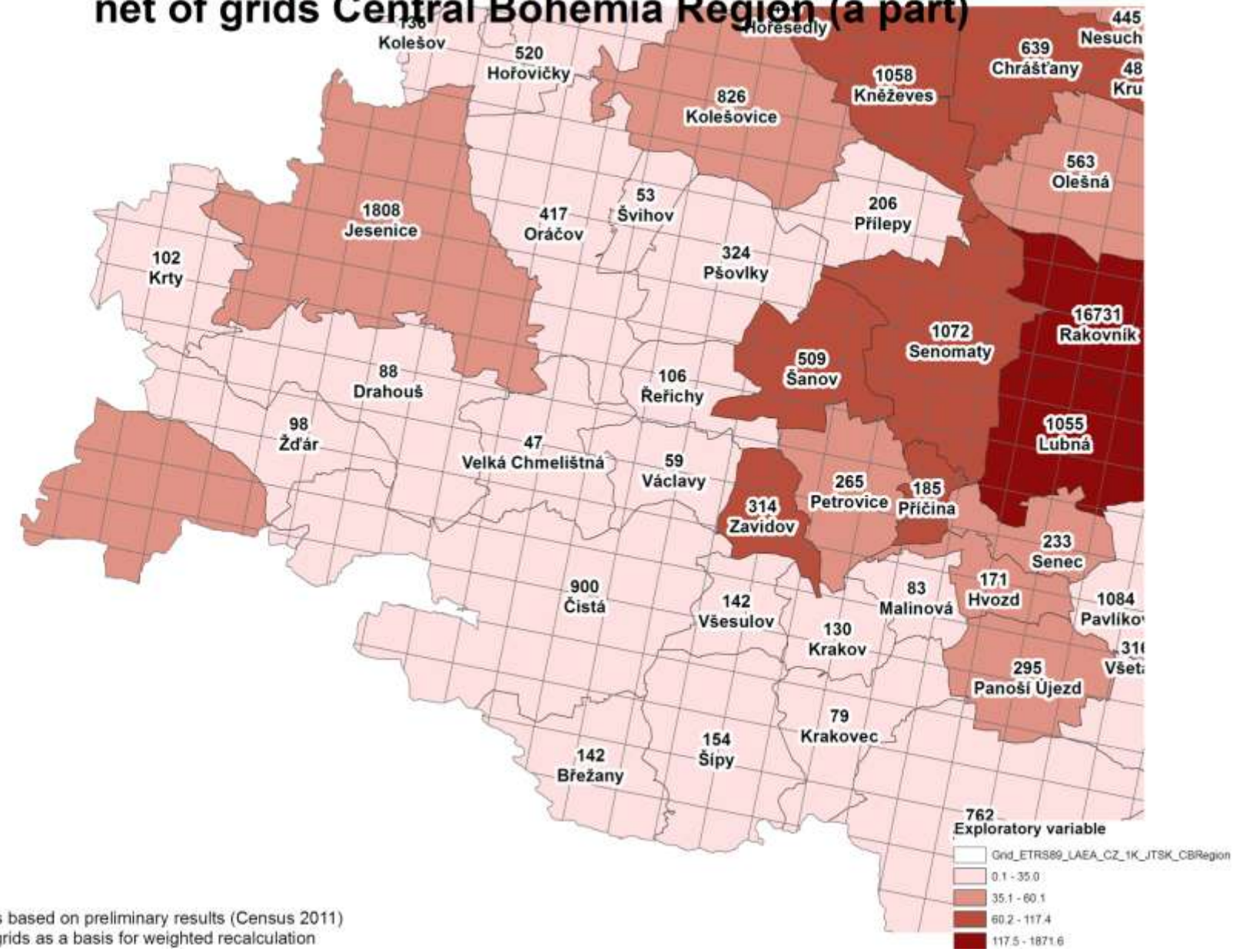
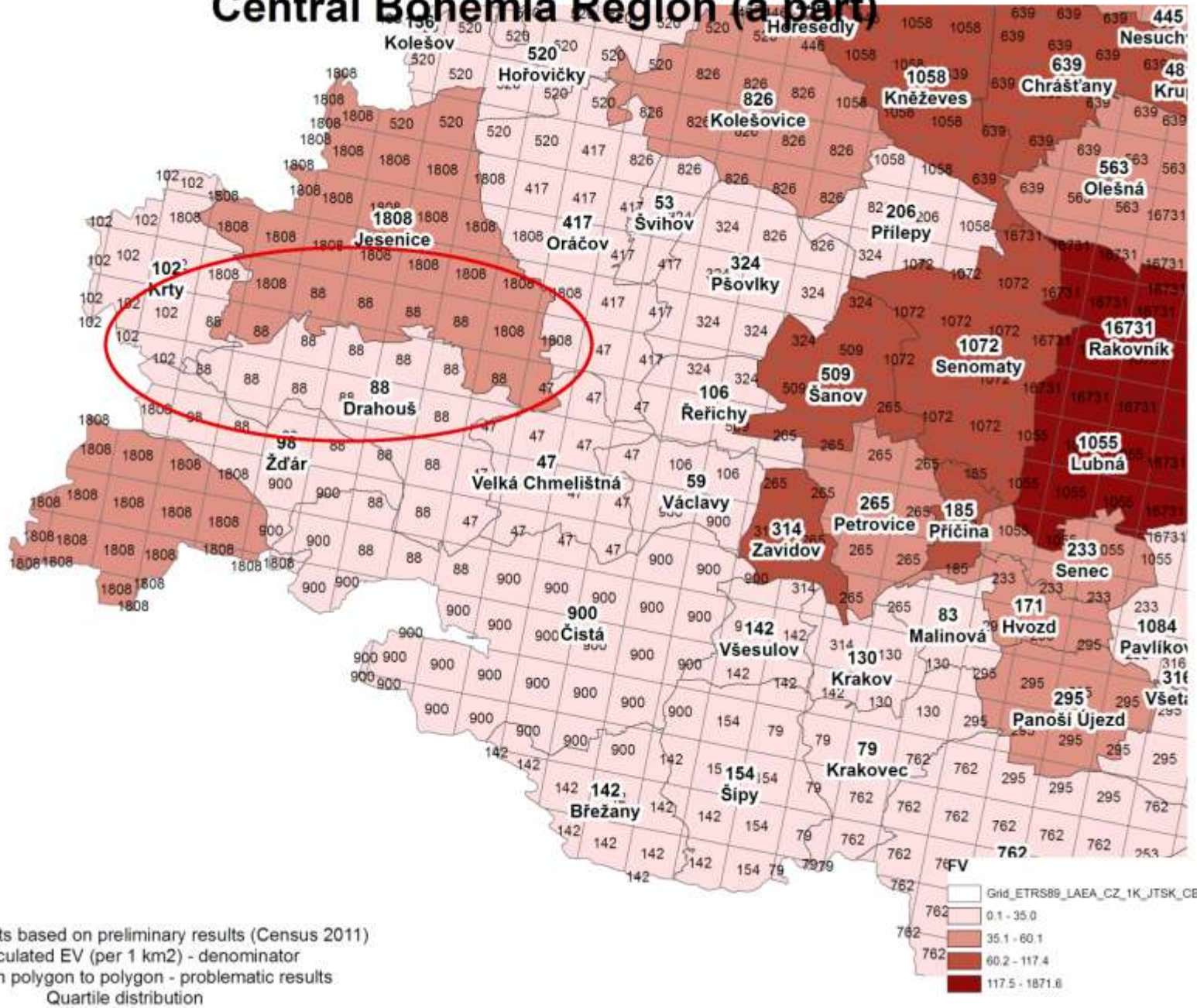
Exploratory variable by municipalities (Census 2011) , net of grids Central Bohemia Region (a part)



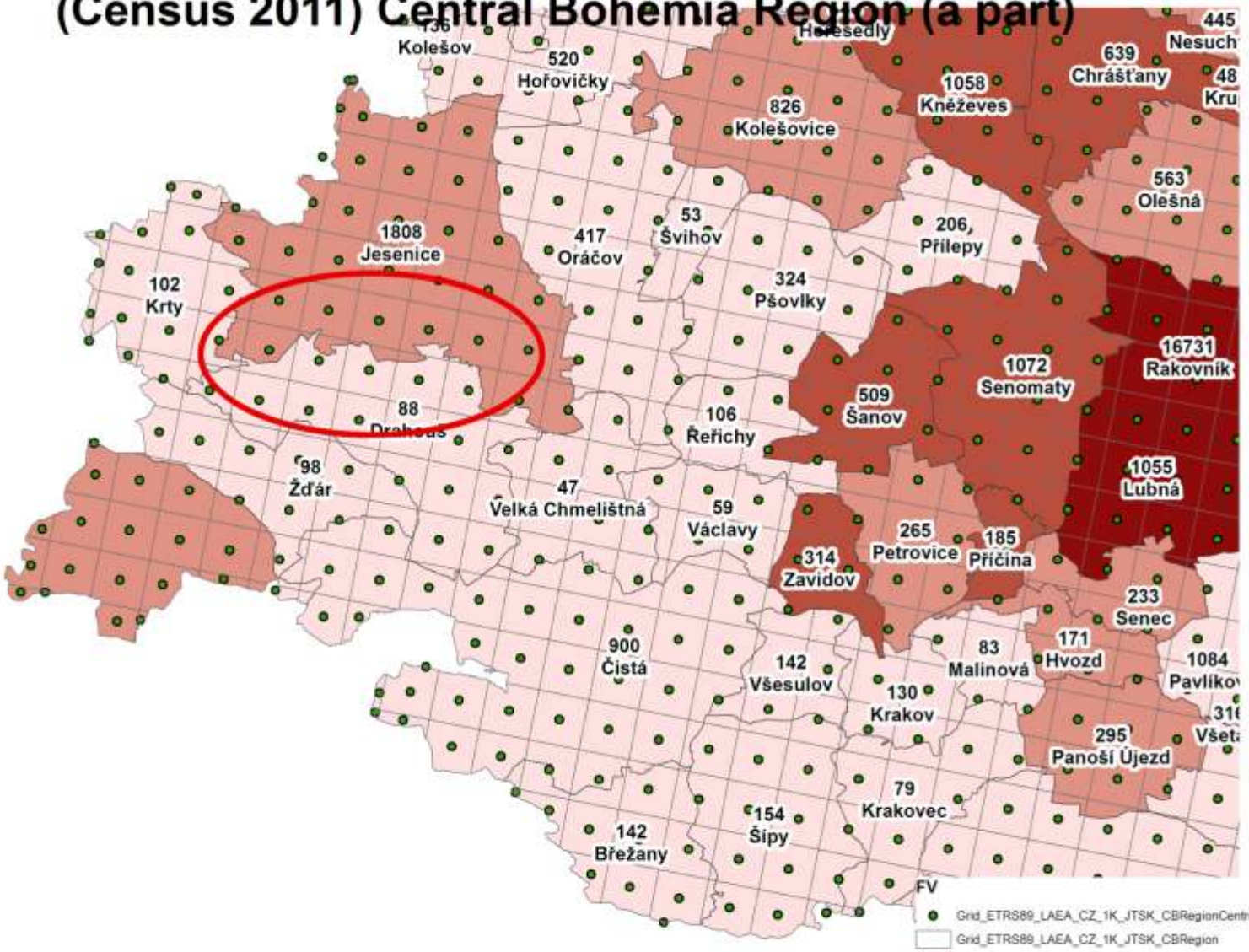
Working outputs based on preliminary results (Census 2011)
Network of grids as a basis for weighted recalculation

Recalculated EV by network of grids (Census 2011)
Central Bohemia Region (a part)



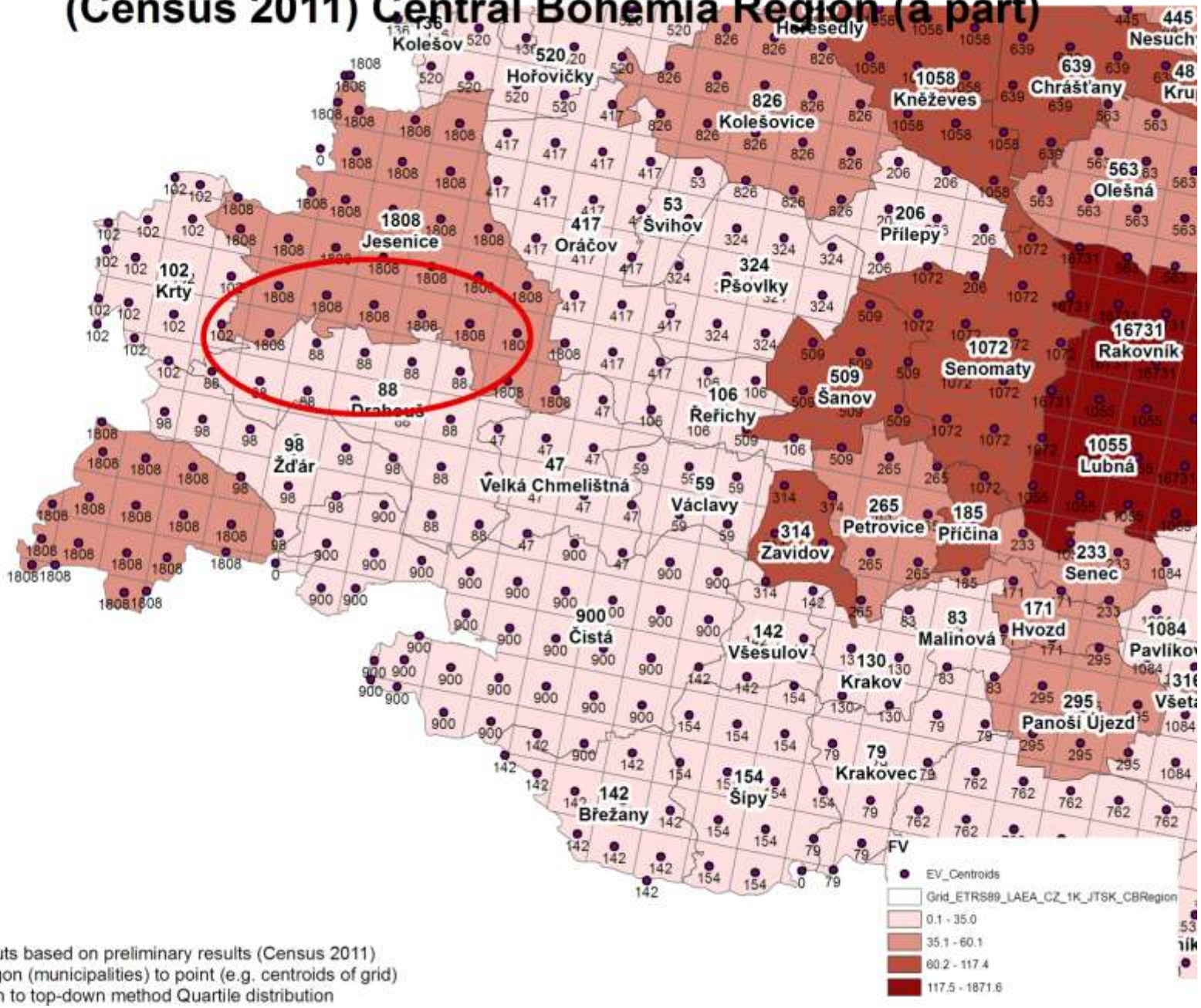
Working outputs based on preliminary results (Census 2011)
Recalculated EV (per 1 km2) - denominator
Spatial join polygon to polygon - problematic results
Quartile distribution

Exploratory variable recalculated by network of grids (Census 2011) Central Bohemia Region (a part)



Working outputs based on preliminary results (Census 2011)
Approach to top-down method Quartile distribution

Exploratory variable recalculated by network of grids (Census 2011) Central Bohemia Region (a part)

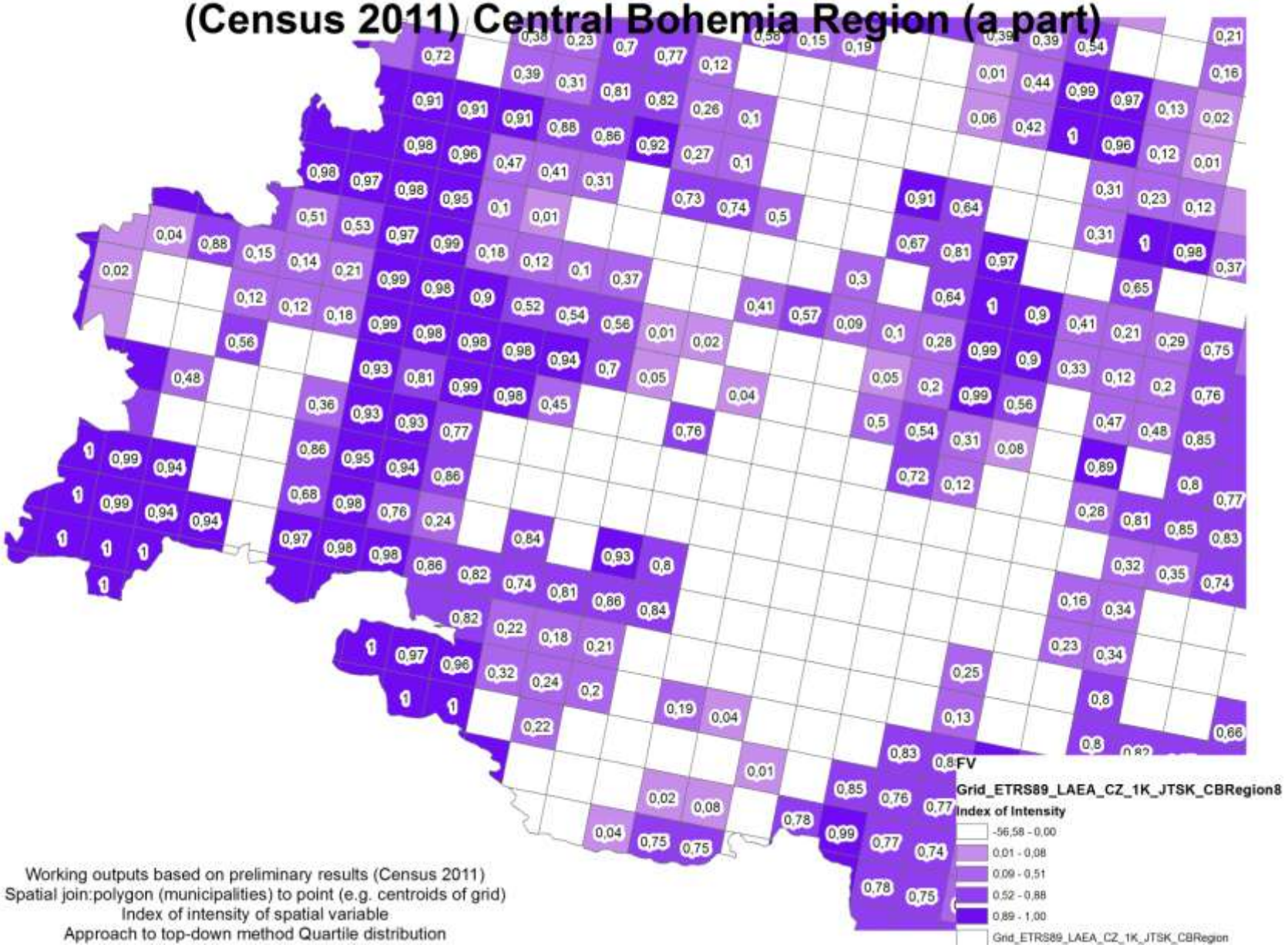


Working outputs based on preliminary results (Census 2011)
Spatial join:polygon (municipalities) to point (e.g. centroids of grid)
Approach to top-down method Quartile distribution

Recalculation

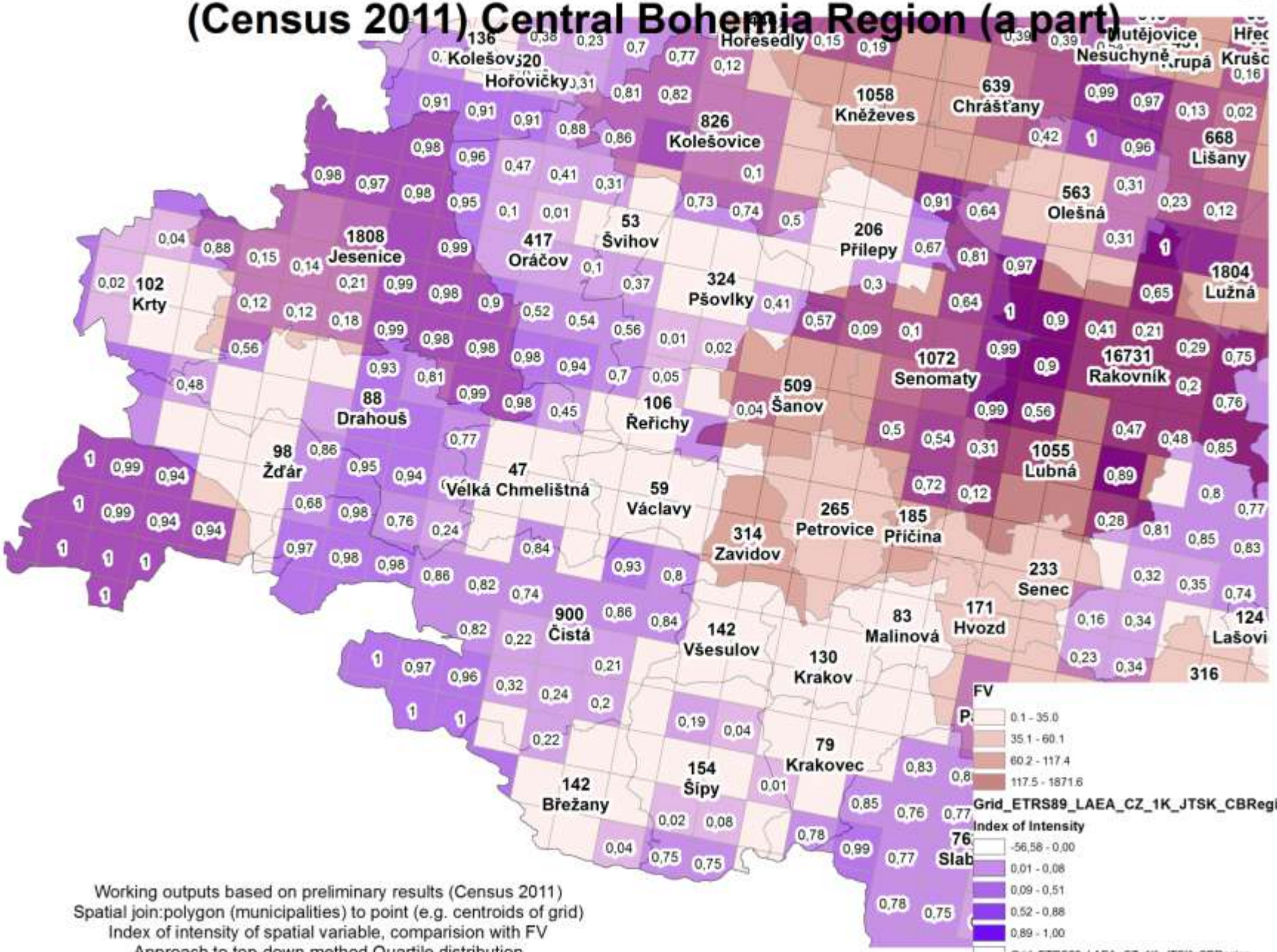
- The result is spatially weighted exploratory variable

Index of intensity of spatial variable recalculated by network of grids (Census 2011) Central Bohemia Region (a part)



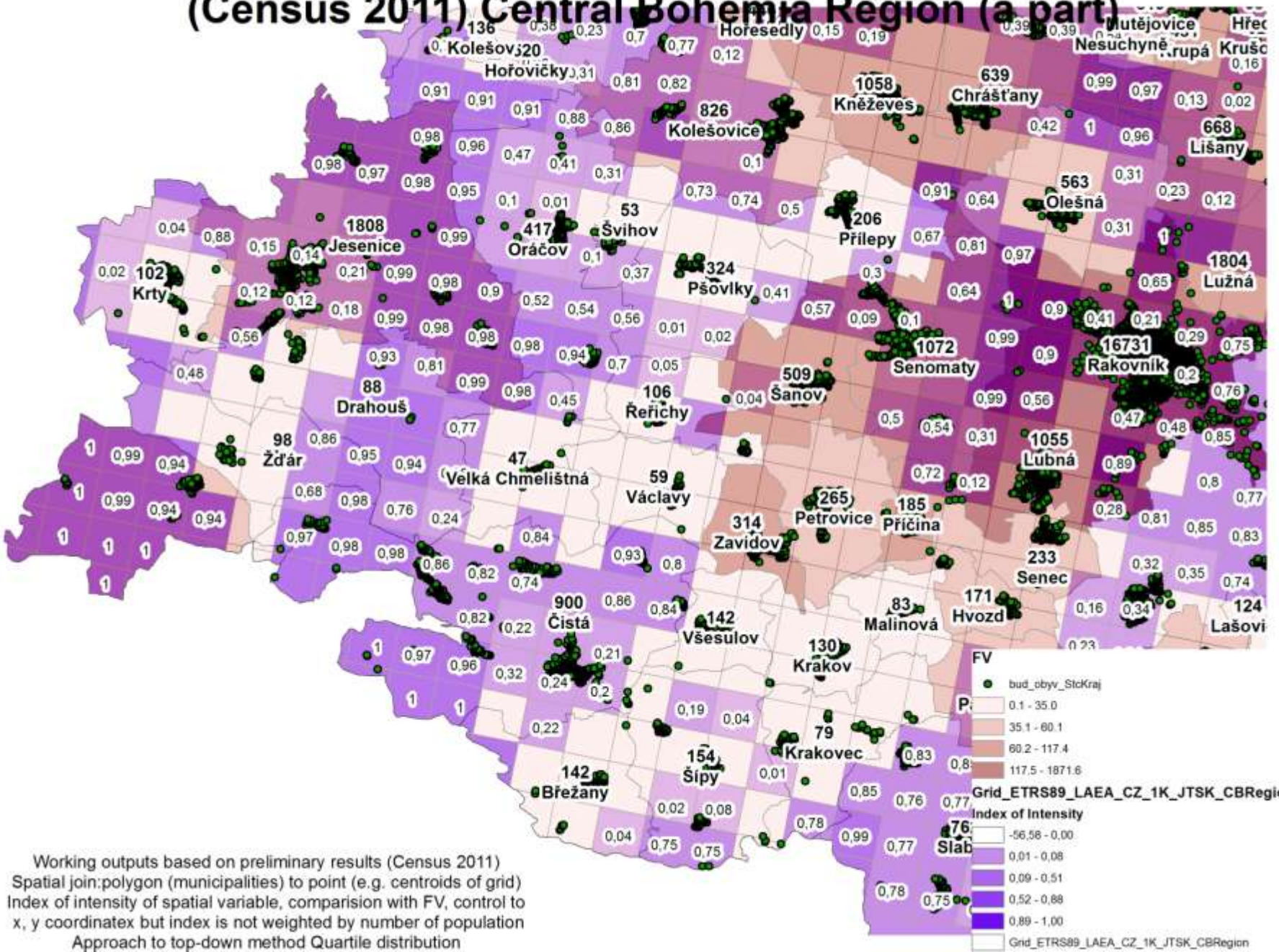
Working outputs based on preliminary results (Census 2011)
Spatial join:polygon (municipalities) to point (e.g. centroids of grid)
Index of intensity of spatial variable
Approach to top-down method Quartile distribution

Index of intensity of spatial variable recalculated by network of grids (Census 2011) Central Bohemia Region (a part)



Working outputs based on preliminary results (Census 2011)
Spatial join:polygon (municipalities) to point (e.g. centroids of grid)
Index of intensity of spatial variable, comparision with FV
Approach to top-down method Quartile distribution

Index of intensity of spatial variable recalculated by network of grids (Census 2011) Central Bohemia Region (a part)

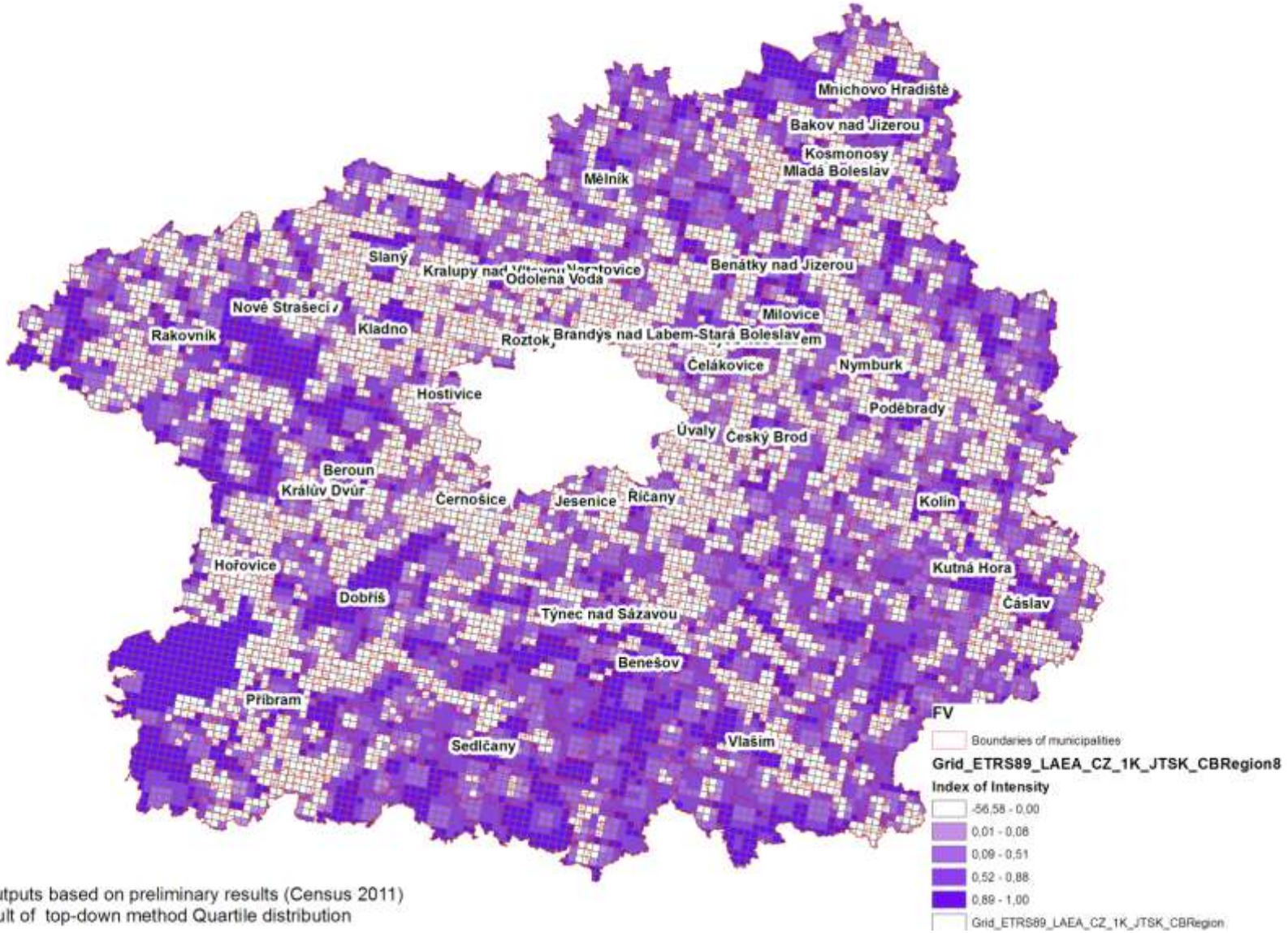


Working outputs based on preliminary results (Census 2011)
Spatial join:polygon (municipalities) to point (e.g. centroids of grid)
Index of intensity of spatial variable, comparision with FV, control to x, y coordinatex but index is not weighted by number of population
Approach to top-down method Quartile distribution

Conclusion to top-down method

- Explaratory variable can be used for explanation of explanation variable
- There should be spatial relationship between these two variables
- One to one variable is the simpliest model – the reality is much more complex
- Spatial regression model

Index of intensity of spatial variable recalculated by network of grids (Census 2011) Central Bohemia Region



Working outputs based on preliminary results (Census 2011)
Result of top-down method Quartile distribution

- Thank your for your attention