

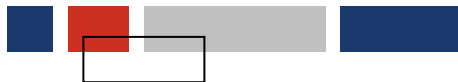


INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

Creating 2001 to 2011 population grids using Census Geography

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SUMMARY/OVERVIEW



- Introduction
- 2001 and 2011 Census Geography
- Methodology
- Results
- Conclusions

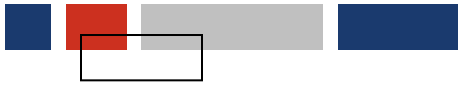


INTRODUCTION

- 
- At Statistics Portugal (INE) no production of statistics for GRIDs exists
(only administrative level and NUTS areas)
 - Population data for non-census years are only available on municipality (NUTS4) level
 - Potential of using the 2001 and 2011 Census Geography for aggregation and disaggregation of GRID data
 - INE is one of the partners in GeoSTAT 1A project



CENSUS GEOGRAPHY



- Since 1991 available in digital format
- Lowest level is building block
- During the 2011 census operation, all the buildings of the different households have been georeferenced



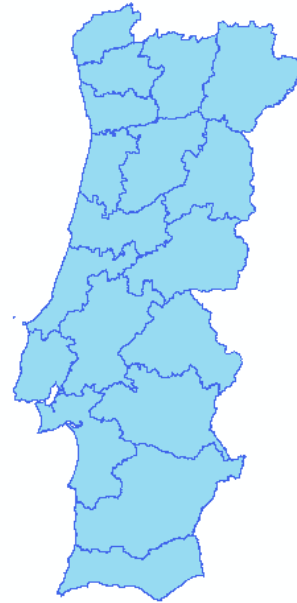
CENSUS GEOGRAPHY



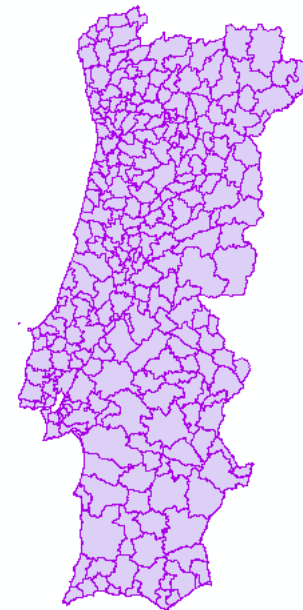
Census 1991 - 2011 Geographical information

▶ Administrative levels

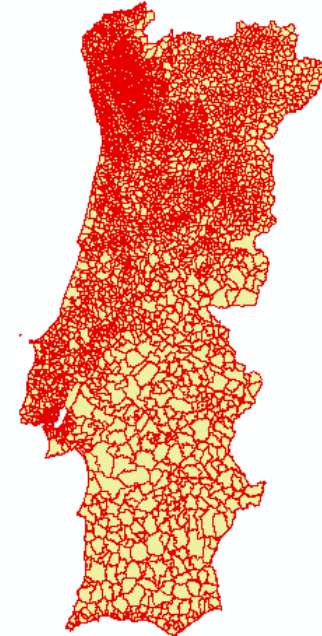
- District
- Municipality (LAU1)
- Parish (LAU2)



District



Municipality



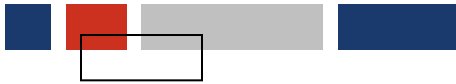
Parish

▶ Statistical levels

- Section (enumeration area)
- Subsection (building block)



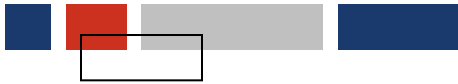
CENSUS GEOGRAPHY



The evolution of the small statistical areas through the Census

Census	Small areas Sections (enumeration areas)	Small areas Subsections (building blocks)	100% Portugal	Digital formal	Street centerline	Buildings
1981	Major cities	Major cities	No	No	No	No
1991	13 705	106 626	Yes	Yes	No	No
2001	16 094	177 893	Yes	Yes	Yes – With some street names	Partial – 400 000
2011	18 074	265 955	Yes	Yes	Yes, with street names, door numbers and postal code	3 549 435





Creating Population GRIDs for continental Portugal using the Census Geography

Deliverable GeoStat 1A project

1. GRID with 2001 population data

New Methodologies:

2. INSPIRE reference grid with population data for 2001 and 2011
3. INSPIRE reference grid with population data for the years 2002 until 2010





1. Population GRID for 2001

- Using population data on subsection level from the 2001 Census
- Assumption of uniform population distribution within a subsection
- Not using the INSPIRE reference GRID, the data is in a local projection
- Using the area of subsection to determine the values for each cell which is located in more than one cell(proportional calculation)





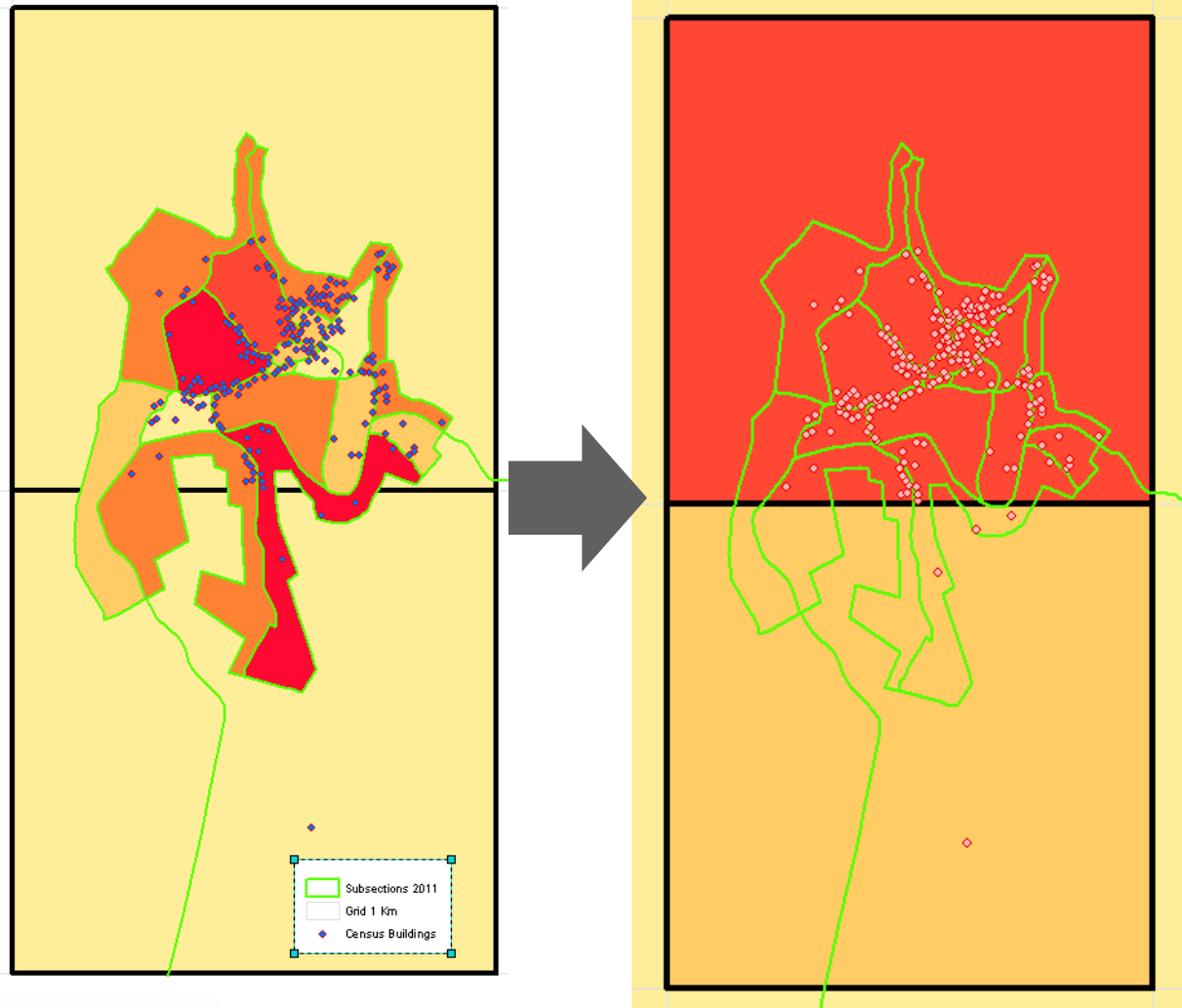
2. New approach for the 2001 and 2011 population GRID using information at building level

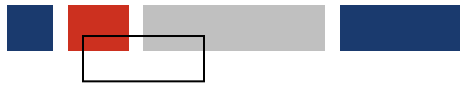
- Using the distribution of the **2011** buildings within the subsections (2001 or 2011) and cells as a variable for the 2001 and 2011 population distribution, instead of the area
- Using the INSPIRE reference GRID and ETRS89-LAEA projection
- Data at building level from the 2011 census will only be available (dwellings and year of construction) at the end of the year 2011



METHODOLOGY

Using the number of buildings located within 2001\2011 subsections and cells to divide the population of subsections located in different cells



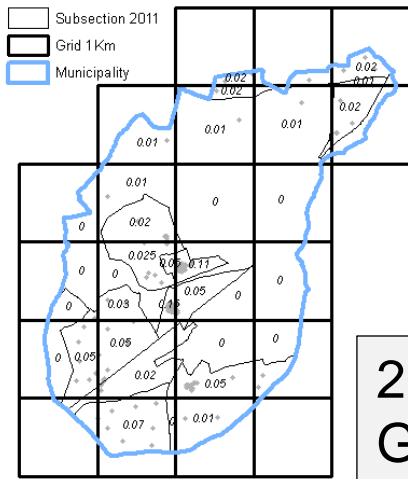
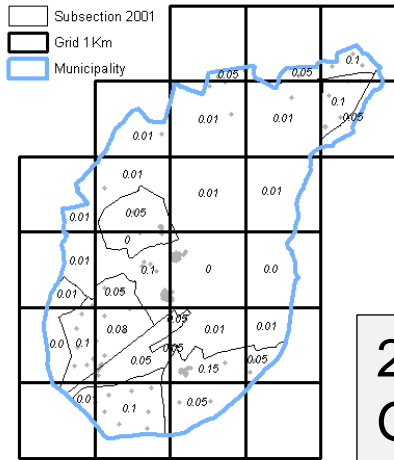
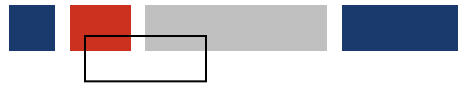


3. Population GRID for the years 2002 to 2010 (1)

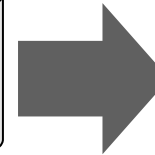
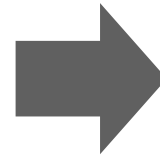
- Population data for non Census years is only available on municipality level (LAU1)
- Need for downscaling of municipality data to 1 Km² GRID
- Using the 2001 and 2011 population distribution within the different cells and a municipality
- Buildings as an alternative instead of other auxiliary variables, like landuse data (CLC, Soil Sealing)
- Relatively easy to implement



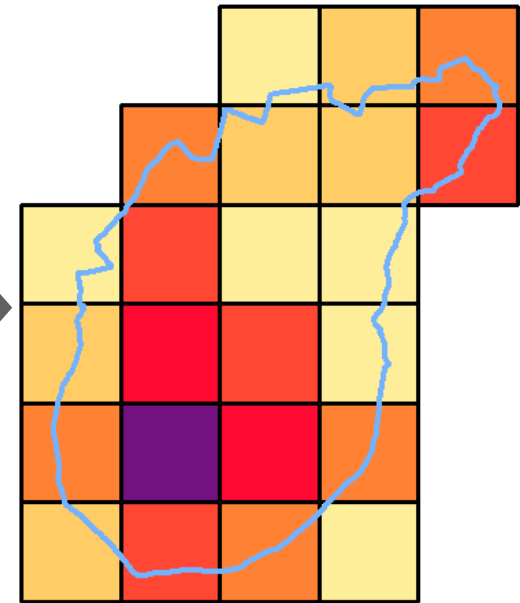
METHODOLOGY



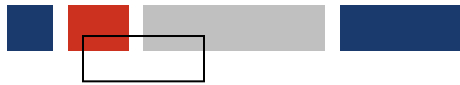
*Downscaling municipality data to 1 Km² GRID
Using different weights for 2001 and 2011
Geography (0,1 to 0,9)*



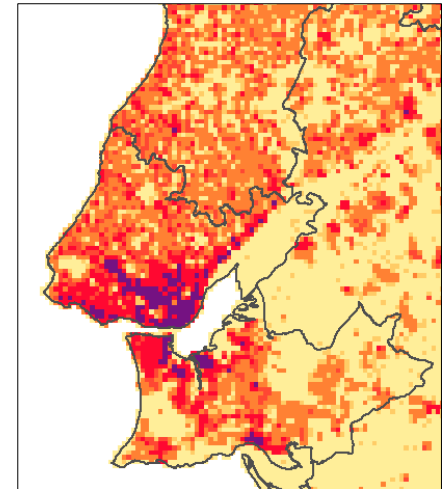
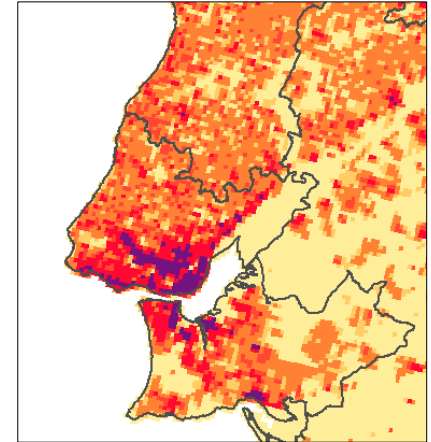
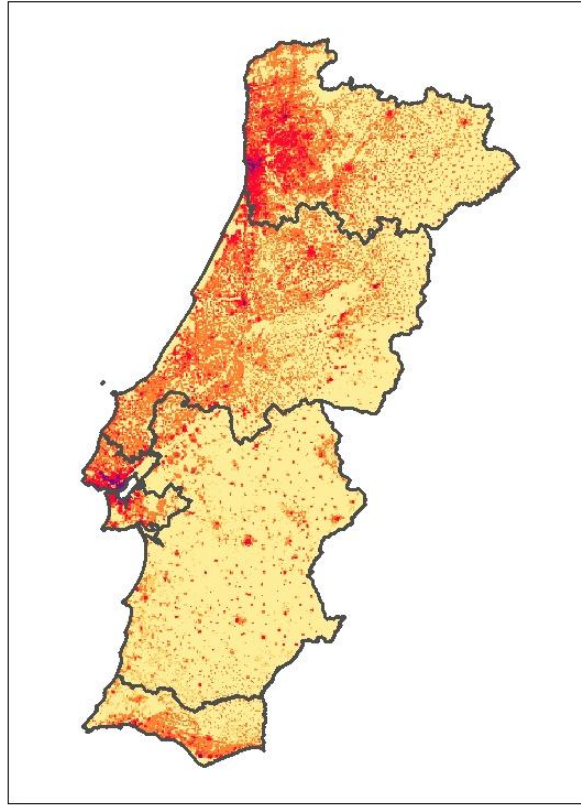
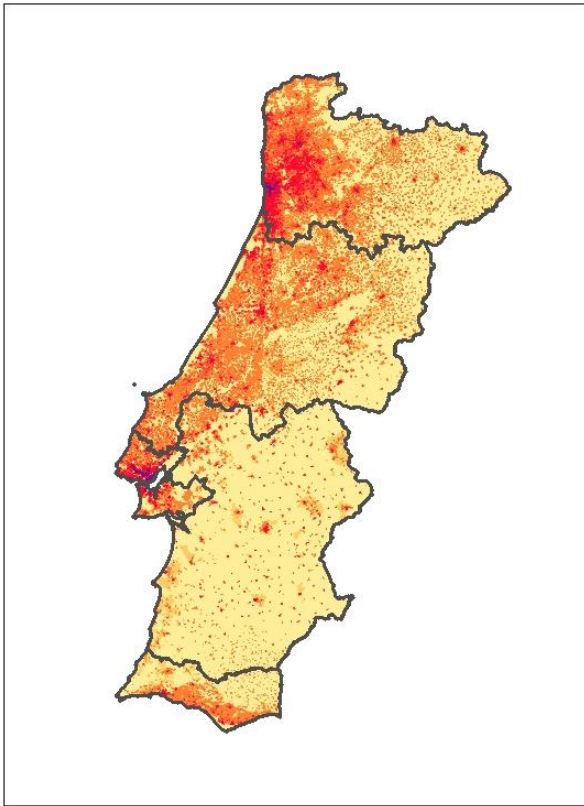
Grid Maps
2002 - 2010



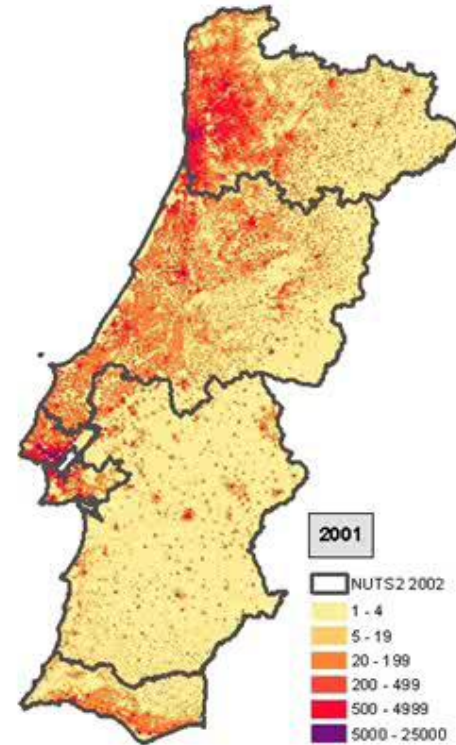
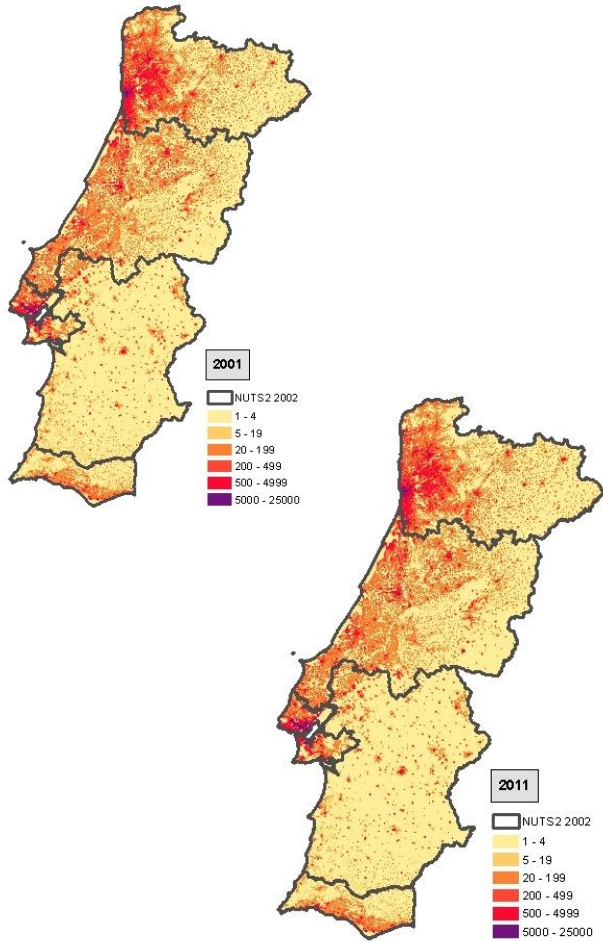
*For the years 2002 – 2010 using:
Weights 2001: 0,9 to 0,1
Weights 2011: 0,1 to 0,9*



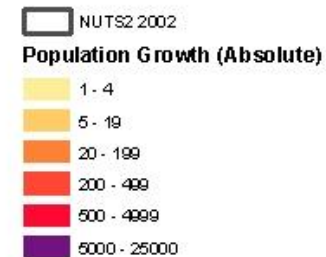
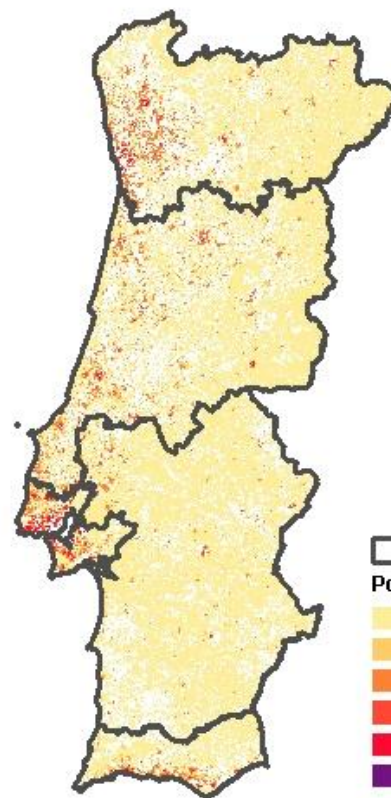
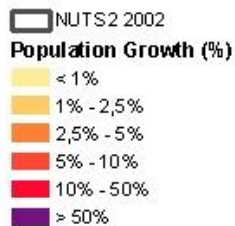
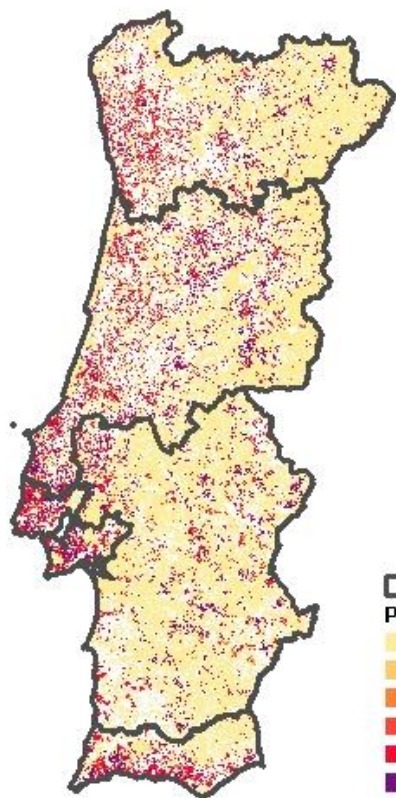
Population GRID 2001 – 2 methods



Population GRIDs 2001 until 2011



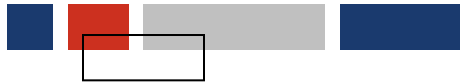
Growth between 2001 and 2011 (relative and absolute growth)





- Small differences between the 2 methods tested for the 2001 population data
- No obvious differences between the 2001 and 2011 population distribution
- Using the same methodology it is possible to create maps for the years 1991 until 2000
- New approach to create GRID maps using the information of the building's location
- Method need to be further tested and improved with new information



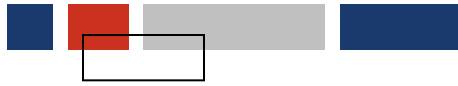


Future Developments

- Publication of the provisional Census results, data will exist about:
 - Year of building
 - N^o of dwellings and population within building
- INE is making a study to publish yearly population data at parish level (LAU2)
- Using the 2011 buildings as the base for the new master sample, it will be necessary to keep it actualised

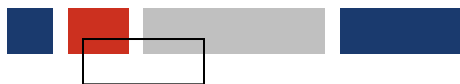


CONCLUSIONS



- Taking advantage of all the available information for downscaling municipal data
- It is necessary to analyse other relevant variables as a measure for the population distribution
- Specific approach for the data available in Portugal
- How to proceed for other variables of socio-economic nature?
- We do not fully understand yet at what level and how GRID data is used in Portugal





Thank you

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