

Landscape changes analysis

Exploring the relationship between Census and Land Cover data

H. Madureira¹, A. Monteiro¹, T. Andresen²
¹Geography Dep. ²Landscape Architecture Dep.
 Porto University, Portugal

SUMMARY

Background Landscapes are shaped by complex relationships between human population, social structure, and environmental conditions. Therefore, landscapes can be studied through different data and methodologies. One important type of socioeconomic data, census data, records all members of a population and their related socioeconomic variables with regular series. On the other hand, remotely sensed data have become increasingly available during the past few decades, allowing quick information about land-cover changes over large areas. Our objective is to show in what way two data sources can be complementary in the landscape change studies.

Methods We use the River Leça Basin case study, a small basin of north-western Portugal, defining a northern crown of Porto's metropolitan region. It covers different territorial and landscape contexts, from that more urbanized in the basin downstream (Porto's urban centre) to the less urbanized area further the basin upstream. We developed a methodological framework to evaluate the River Leça Basin landscape changes between the 1950's and the 2000's based on two complementary and integrated approaches: at census block level and at land cover level.

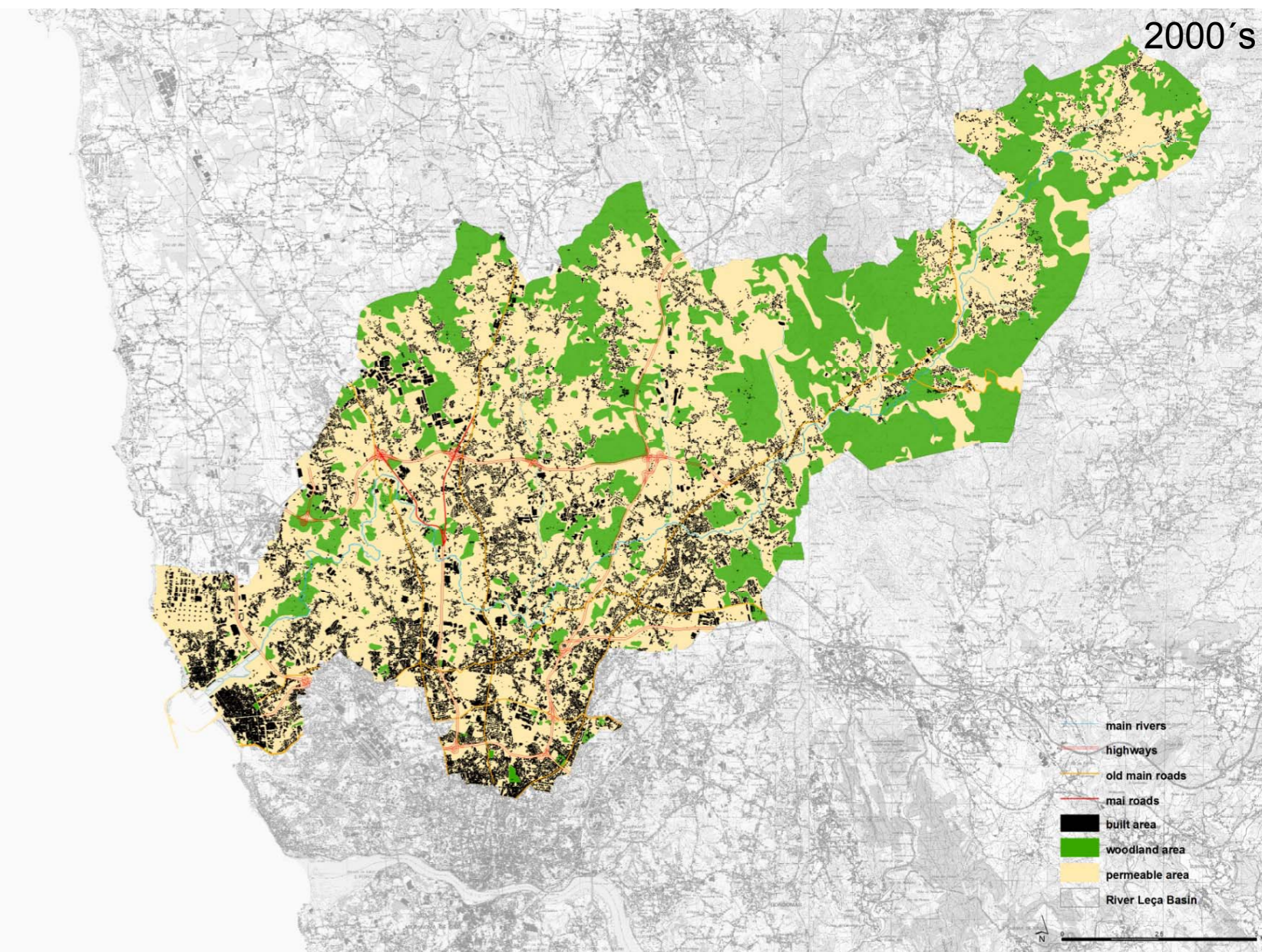
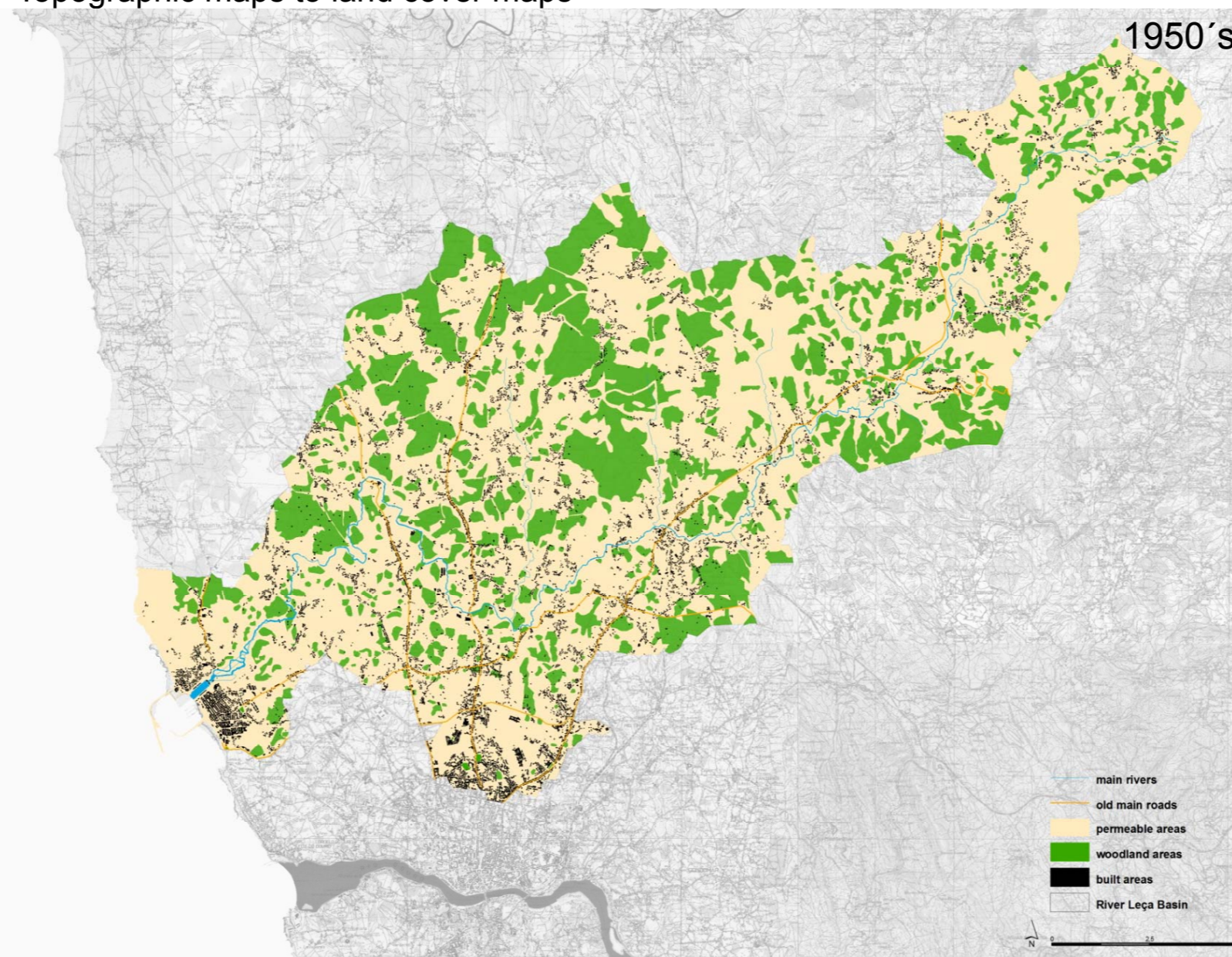
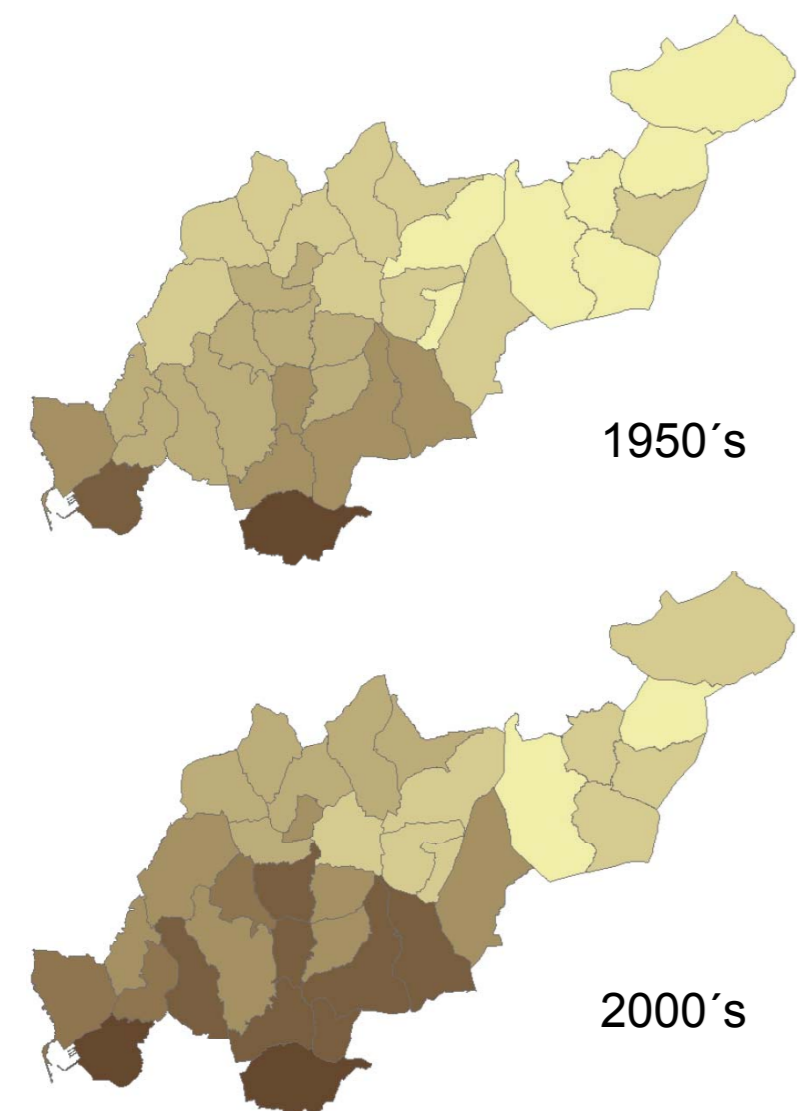
Results The two described approaches can be used in a complementary way: at the census block level of aggregation we obtained the different magnitudes of landscape changes; the land cover data allow us to find which territorial forms matches the different landscape changes magnitudes.

RESEARCH DESIGN

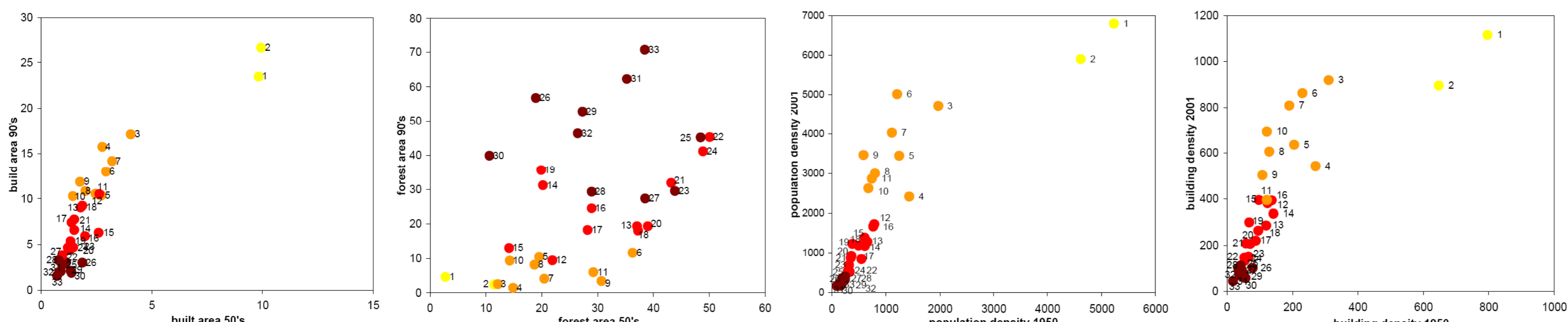
1. DATA SOURCES AND DATA TRANSFORMATION FOR SPATIAL ANALYSIS IN GIS

Census data to thematic maps at census block level

Topographic maps to land cover maps



2. DATA CORRELATION (AGGREGATION AT CENSUS BLOCK LEVEL)



increase of green areas and their power to explain the landscape changes
 decrease of built areas and their power to explain the landscape changes

3. LANDSCAPE CHANGES ANALYSIS RESULTS

Territorial forms of landscape changes

	urban decentralization		green structure reorganization			
	polycentric structure consolidation	urban development outside the polycentric structure	consolidation of linear urbanization	intensification of urban sprawl	decrease and fragmentation of green structure	changes in forest/agricultural mosaic
I	●			●	●	
II		●	●	●	●	
III			●	●	●	●
IV				●		●

Magnitudes of landscape changes

