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The ENACT project: towards spatiotemporal activity and population mapping in Europe

Abstract

Population is a crucial variable for the social sciences, the geosciences and for policy support. Yet, our knowledge of its spatial distribution remains very incomplete. Population is a temporally dynamic variable, with major shifts in its distribution occurring in daily and seasonal cycles, resulting in rapidly changing population densities. High spatial resolution representations of night-time (or residential) population exist at European level since several years. But information on the population distribution for other time frames is limited to case studies, and often not comparable. Consequently, all applied sciences and policy support that require spatially detailed information on population distribution are based on only a fractional and static representation of reality. This knowledge gap still exists today due to methodological challenges and lack of appropriate data. While most countries systematically collect and disclose high spatial resolution data on night-time population, official data on employment, activities and commuting (which could be used to derive day-time population distribution) are often only disclosed at coarse aggregation levels.

‘ENACT’ is an exploratory research project which will be conducted by the Joint Research Centre of the European Commission throughout 2016 and 2017. The main objective of the ENACT project is to develop and implement a consistent and validated methodology to produce day-time and seasonal population distribution grids for Europe. For this objective to be achieved, the project will have to (1) obtain the number of people per type of activity, per time-frame, and per region, and to (2) determine their likely location at high spatial resolution. The first step requires regional data on residents, workers per sector of activity, students and tourists which will be derived mostly from official sources. The second step requires spatial data on the location of activities (e.g. manufacturing, retail, health, education, leisure and tourism), which will be sought out from various conventional sources (e.g. remote sensing imagery, land use maps) and big data (e.g. mobile phone operators, internet, volunteered geographic information).

Population dynamics are faster than ever before, and researchers and decision-makers cannot wait until perfectly consistent and harmonized data are collected by official organizations. The ENACT project proposes to leverage already available data, from both conventional and unconventional sources, to expand our knowledge base of spatiotemporal population patterns and flows across the continent. These data can then be used as input to land use, transport, or environmental models, as well as, amongst others,

natural and technological risk assessment, disaster management, and regional planning applications. The presentation of the project at the EFGS 2015 Conference will address its scope, the proposed input data sources, methodology and workflow. In addition, we hope to incite interest from the various National Statistical Institutes present, stimulate debate on methodological issues, and foster potential collaborations.