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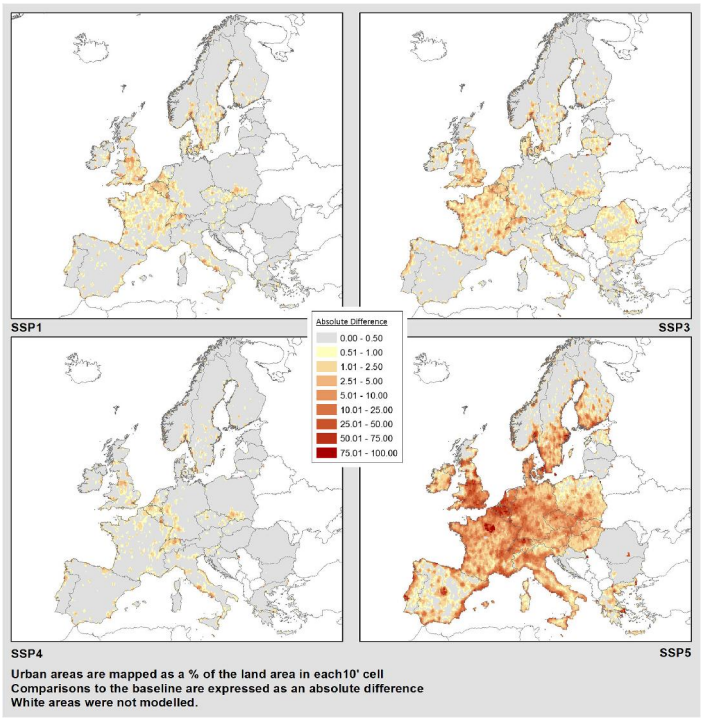
Population driven urbanisation

Utilising the SSP framework

Fig 1. The projected change, from baseline, in artificial surface extent (as a percentage of the 10' cell land area) by 2100 under four different socioeconomic scenarios. Darker colours are associated with greater artificial surface expansion



Urban areas are mapped as a % of the land area in each10' cell
Comparisons to the baseline are expressed as an absolute difference
White areas were not modelled.

We modelled (i) population structure and dynamics, and (ii) changing values and preferences driving urban land use across Europe up to 2100 with a regional urban growth model.

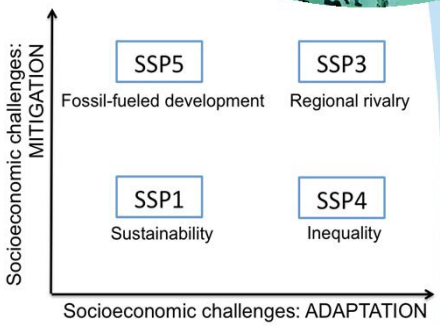


Fig 2. Adaptation and mitigation challenges of the different SSPs (adapted from O'Neill et al., 2015)

Artificial surfaces cover approximately 4% of European land surfaces. Despite their restricted extent, they are home to nearly three quarters of the European (EU-28) population, account for ~80% of European energy use and emit ~69% of Europe's CO_2.

Key factors driving future urban form:

(i) a changing population and demographic structure
(ii) changing cultural/societal values, living standards & preferences
(iii) environmental and social policy
(iv) regulatory frameworks.

We witness the effects that

(i) baseline (2010) year differences in age structure have on future regional change
(ii) SSP-specific demographic assumptions on fertility and
(iii) scenario specific societal preferences have on intra-European development.

The results provide a discussion point on the importance of population structure & development of (age specific) living preferences in driving future artificial surface demand, i.e. urbanisation.

Research Gap

1) Quantified data & foresight of the influence of preferences and age structure on the development of the urban and built environment

- Key factors driving the form of future urban areas include (i) a changing population and demographic structure, (ii) changing cultural/societal values and living standards, (iii) environmental and social policy, and (iv) regulatory frameworks. Taking into account population structure (demographics) and changing preferences clearly impacts the extent of required artificial surfaces.

RECOMMENDATIONS

1) Quantification & foresight on preferences and age structure for development of the urban & built environment

2) Forward-looking spatially explicit socioeconomic indicators

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- In the face of severe adaptation needs and locally varying capacities, there is a huge demand to address spatially explicit socioeconomics. To inform current and longer-term climate adaptation, we will need forward-looking information the key issues: demographics, income, education etc. that pave the way to quantifying overall vulnerability and adaptive capacity inherent in local communities.

Terama, E. et al. 2017. Modelling population structure in the context of urban land use change in Europe, Regional Environmental Change. https://link.springer.com/article/10.1007/s10113-017-1194-5

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