

Transitioning to sustainable and climate-resilient urban equilibria: Insights from green infrastructure, flood risks, and housing markets in Helsinki

Athanasios Votsis (presenter; athanasios.votsis@fmi.fi); Adriaan Perrels (adriaan.perrels@fmi.fi)
Finnish Meteorological Institute (Socioeconomic Impacts Group), Helsinki, Finland.

As sustainable urban development and climate adaptation strategy are increasingly overlapping, the necessity to synchronize nature-based solutions and natural hazards risk management with urban economic objectives becomes ever clearer. The role of climate-sensitive natural risks and amenities in markets and urban planning is central in this issue, whereas the response of the planning system to both markets and risks-amenities can transform promising scientific ideas into workable urban solutions.

This presentation discusses empirical evidence from the metropolitan area of Helsinki about the reaction of its housing markets and planning system to changes related to green infrastructure and flood risks. The results are based on the analysis of combined economic-environmental-infrastructure microdata from 2000-2011 and on urbanization simulation scenarios until 2040. On one hand, green interventions capitalize positively in the housing market, but not unconditionally; successful policies must account for the nuances of urban economic behavior and its geographical heterogeneity [1]. On the other hand, although the housing market can process risk information with notable accuracy, the planning system must support a responsive market, if any transition towards a sustainable and climate-resilient spatial equilibrium is to happen [2, 3]. The discussed reactions exhibit non-trivial spatial characteristics and highlight difficult trade-offs surrounding the design, implementation, and effectiveness of spatial interventions: climate-resilient sustainable urbanism can be challenging to conceptualize and demanding to implement if approached lightly.

The results demonstrate that physical or behavioral planning interventions surrounding climate-sensitive risks and amenities can be also socially and economically sustainable when planned carefully and when attuned with market mechanisms. Guidance for this goal can be provided by research on climate-related interventions that accounts for the behavior of key urban actors – in planning systems and in the urban economy.

- [1] Votsis A. (2017) Planning for green infrastructure: The spatial effects of parks, forests, and fields on Helsinki's apartment prices, *Ecological Economics* 132: 279–289.
- [2] Votsis A., Perrels A. (2016) Housing prices and the public disclosure of flood risk: A difference-in-differences analysis in Finland, *Journal of Real Estate Finance and Economics* 53(4): 450–471.
- [3] Votsis A. (2017) Utilizing a cellular automaton model to explore the influence of coastal flood adaptation strategies on Helsinki's urbanization patterns, *Computers, Environment and Urban Systems* 64: 344–355.