



From scientific knowledge to individual change of habits: the Barcelona Living Lab on extreme events

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Barcelona constitutes a good example of a Mediterranean coastal megacity that can be severely affected by climate change impacts. The urban heat island effect, which is particularly important in Barcelona could magnify direct impacts on health produced by the frequency and intensity increase in heat waves and tropical nights. If we consider the Metropolitan Area of Barcelona (AMB) where 52.8% of its surface area is urban, is possible to see maximum temperatures higher than 35 °C in the city center, with minimum nighttime temperatures above 23°C, while coastal peri-urban areas register 4°C less than in the city. Besides this, in a warmer climate, the risk of floods might also increase. Floods are relatively frequent in the AMB with more than 3 pluvial flood episodes per year and over 7 Million €₂₀₁₅ paid for flood damages between 1996 and 2014 by the national insurance company “Consortio de Compensación de Seguros”.

Nevertheless, the impacts of these events across the city are heterogeneous and highly dependent on its urban planning, socioeconomic distribution, topography, and the characteristics of the meteorological systems affecting it. As a result, Barcelona resilience has a strong dependence on local factors that must be accounted for in the design of any management plan or adaptation strategy that must be adopted by the municipality, its citizens or socioeconomic actors. In this context of hydrometeorological risks that are going to worsen over time, and with the goal of improving resilience in a sustainable way, the Barcelona Living Lab on Extreme Events (Barcelona LLEE) was born under the auspices of the I-Change (Individual Change of HABits Needed for Green European transition) project and in collaboration with the C3-RiskMed project.

This communication begins with the knowledge about intense rains, floods, and extreme temperatures in AMB, continues with the strategy that will govern the Living Lab, and ends with the methodological proposal that will govern the experiment. The first part is based in the application of the Local Climate Zones to do a classification of the different land covers and land uses of AMB and obtaining the spatial distribution of temperature at high resolution in present and future scenarios as well as its impact in the risk mortality (Gilabert et al., 2021). On the other hand, flood events have a heterogeneous effect across the city due to differences in the urban planning, its topography, the distinct socioeconomic distribution, and the intrinsic characteristics of these precipitation systems that have been analysed through the meteorological radar and considering information provided by the company responsible of the drainage system (Esbrí et al., 2021). The second part shows the seven points of the strategy that governs the Barcelona LLEE and pretends to engage citizens and

stakeholders in the project for Green European transition. Finally, the methodology includes the use of the App FLOODUP in the framework of citizen science.

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