Analyzing the spatial pattern of flooding events: a study case of São Caetano do Sul, São Paulo, Brazil

According to the United Nations (UN), the world's population was approximately 7.63 billion people in 2018, with 55% residing in urban areas. By 2050, current projections estimate that the global population will grow to 9.77 billion people, and the world's city dwellers are expected to be 6.6 billion people (68% world's population). In other words, around 2.5 billion people will be absorbed by cities (UN, 2019).

One of the most striking consequences of urban growth is the increase in impervious surface areas (ISA), which in turn can lead to seriously hydrological impacts in urban areas (Faulkner, 2004), mainly by modifying surface infiltration characteristics (Du et al., 2012). The clearest impacts of urban imperviousness on hydrological systems include reducing infiltration and hence decrease of groundwater recharge (Faulkner, 2004); increasing surface runoffs (Leopold et al., 1995), in terms of speed, volumes and peak flow (Rose & Peters, 2001); increases in flood frequency (Hollis, 1975) and its magnitude (White & Greer, 2006) in flood-prone areas; and decrease lag times, e.g. time for floods to peak (Leopold, 1968).

In this context, urban flooding represents a source of hazards for both developed and developing countries (Jha, Bloch & Lamond, 2012). To face urban flooding requires discussion and development of scientific and technological knowledge, in addition to new governance approaches, which must be adapted to the local reality (Jha, Bloch & Lamond, 2012). Therefore, understanding the flooding risk hotspots is arguably a crucial tool to decision making (Jha, Bloch & Lamond, 2012; Sayers et al., 2013).

To help flood risk managing, this project aims to analyze if there is any spatial pattern in the flooding events in São Caetano do Sul, São Paulo, one of the cities of the metropolitan region of São Paulo that usually most suffers the effects of heavy rains, such as flooding.

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