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Climate change impact on hydraulic structures: Alcala de Henares and Mexico City

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The issue of climate change has been expanding and its impact on urban water infrastructure is an emerging research line. Nevertheless detailed estimates are crucial for reliable predictions. Urban centers are in constant evolution hence their adaptation measures to natural hazards have been and will be of major relevance. Traditionally, climate change patterns are slow and their processes take thousands of years while direct measurements are relatively new. A new phenomenon has emerged with the development of urban centers. Among the most relevant impacts on the urban environment, the change in the design of the water infrastructure has been subjected to these slow and uncertain environmental hazards. For example, the design of an urban sewage structure 100 years ago is likely to be different to the design of the same structure nowadays and within the next 50 years.
In the case of Alcala de Henares, a middle size city within the Madrid urban area, the analysis of local precipitation shows a slight wet period from the 1960's. Such trend does not affect dramatically the design of urban water infrastructure. The findings in Mexico City, one of the most populated cities in the world, exhibit a moderate wet period since the 1950's. Such increase in the amount of precipitation does not necessarily imply a main cause of the failure of urban water systems or for misestimating the design capacity of the original water infrastructure.
Both cases show that the adaptation measures have been satisfactory, despite the occurrence of floods across the majority of urban centers. Nevertheless, a systematic methodology is required for designing water urban infrastructure considering climate and demography related changes.