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# BOOK OF ABSTRACTS

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# GREEN ROOFS RUNOFF COEFFICIENT: DIFFERENT TIME-SCALE APROACHES TO ESTIMATE ITS VALUE

**KEYWORDS**

Green Roofs; Stormwater management; rainwater retention; runoff coefficient

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**ABSTRACT**

The high impermeabilization in densely populated areas brings numerous problems concerning stormwater management, mainly when intense precipitation events occur. This is frequent in the beginning of the winter/rainy season in the Mediterranean region, namely in Portugal. Implementation of nature-based solutions in general, and green roofs in particular, can minimize the damages caused by such events in urban areas. The reduction of stormwater runoff in Green Roofs (GR), can be estimated with the runoff coefficient, a parameter that assesses their hydraulic performance and contributes to the design of the drainage systems downstream. Due to their natural characteristics, GR have variable performance throughout the year and so models used to determine runoff coefficients should reproduce this behaviour as realistically as possible, adjusted to each season and climate region. In this study, monthly runoff coefficient determination, using experimental data, was assessed through the use of a previous developed model. Runoff coefficient was also determined using different time periods (monthly, weekly and per rain-events) to assess the most adequate approach, considering the practical uses of this coefficient. The monthly determination approach resulted in lower runoff coefficient values, than the weekly or per rain-event determination. However, when applied to a long-term performance analysis, this study showed no significant differences when using the monthly, weekly or per rain-event runoff. Furthermore, the results revealed the need to improve the model for extensive Green Roofs determination, taking into consideration other variables besides temperature and precipitation (e.g. early-stage moisture conditions of the GR matrix). The assessment of different time scales for runoff coefficient determination is a major contribution for GR future performance assessment, and a fundamental decision support tool.

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