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Retention and detention performances of green roofs worldwide

Hellies Matteo, Francesco Viola, and Roberto Deidda
Dipartimento di Ingegneria Civile, Ambientale e Architettura (DICAAR), Università di Cagliari, Cagliari, Italy

Urbanization process is rapidly converting forested areas and grasslands to commercial, residential, or industrial spaces, triggering soil degradation and significantly increasing impervious surfaces. Consequently, man-made environments experience significant decrease of infiltration and groundwater recharge, enhancing the problems related to the management and protection from increased stormwater runoff. Green roofs are environmentally friendly structural measures able to mitigate these negative drawbacks due to anthropic transformation, retaining and detaining storm water runoff, with the main advantage of reducing hydraulic loads on combined storm sewer systems.
The aim of this work is to assess the convenience and the feasibility of installing green roofs in any target area of the world, providing a rough indication of geographic regions where green roof installation is possible with good hydrological performance, and feasible in rainfed conditions with low vegetation water stress. To do that we explored in-silico green roofs hydrological performance worldwide, using climatological forcings from ERA-Interim database as input for a simple conceptual hydrological model to estimate green roof outputs, in terms of evapotranspiration and runoff.