A green roof experimental site in the Mediterranean climate: the storm water quality issue

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ABSTRACT

Since 2007, the University of Genova has carried on a monitoring programme to investigate the hydrologic response of green roofs in the Mediterranean climate by installing a green roof experimental site. Aiming at the assessment of the impact of green roofs on the storm water runoff quality, in 2010, water chemistry data are included in the monitoring programme, therefore the monitoring campaign provides one-minute rainfall and outflow data together with water quality data concerning both rainfall and subsurface outflow. As for rainfall, the bulk deposition (including dry and wet fractions) is collected to evaluate the role of the overall atmospheric deposition in altering storm water runoff quality. As for subsurface outflow, 24 composite samples based on uniform time pacing are taken thus aiming at characterizing the whole outflow hydrograph. Water chemistry data reveal that pollutant load associated to green roof outflow is limited; in particular, solids and metal concentrations are lower than values generally observed in storm water runoff from traditional rooftops. With respect to atmospheric deposition, green roof behavior as sink/source of pollutants is investigated based on both concentration and mass, results demonstrate that green roofs have more positive than negative effects on the quality of outflow water.

KEYWORDS

Bulk deposition, green roof, metals, monitoring campaign, solids, water quality