

Greenroof assessment for stormwater management:

The objectives of this project are to characterize stormwater retention by greenroofs with special emphasis on plant water use and to translate monitoring information into models incorporating various climate scenarios for use by stormwater managers, practitioners and planners. Specific research questions to be addressed are:



Figure2. Experimental greenroof platform constructed as part of this project

- How effective might a large scale implementation of greenroofs be at retaining stormwater in example Baltimore watersheds?
- How might rates of evapotranspiration on experimental greenroof platforms influence annual water storage and what factors might affect this ecosystem process ?
- How might Sedum plants, typically found on greenroofs, affect water cycling on experimental greenroof platforms if at all? How important is the relationship between plant physiological processes and water use for predicting stormwater retention by greenroofs?

Why study greenroofs?

Each time it rains, thousands of gallons of water are flushed from impervious surfaces in urban watersheds contributing to the impairment of water resources and the urban stream syndrome (Walsh et al 2005). Roofs are a major component of urban imperviousness. For example, in the Glyndon watershed (Figure 1), a small suburban watershed northwest of Baltimore, nearly 37% of imperviousness is attributed to rooftops.

Figure 1. Glyndon watershed



Greenroofs are examples of low impact designs that can mitigate deleterious effects of stormwater by reducing storm runoff volume and flow rates from roofs by planting of roof surfaces with vegetative cover (Oberndorfer et al. 2007). Pending Maryland Department of the Environment stormwater regulations will require new developments to retain a certain amount of stormwater and greenroofs are listed as an acceptable technology to achieve this goal (MDE 2009). Wider acceptance of this practice as a stormwater management strategy will require more publicly available information about greenroof performance. Work described here aims to improve model predictions about greenroof performance by incorporating monitoring data from 16 experimental greenroof platforms (Figure 2) under varying climate conditions.

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Maryland Department of the Environment (MDE). Stormwater Design Manual.

http://www.mde.state.md.us/programs/waterprograms/sedimentandstormwater/stormwater_design/index.asp

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