

## Day Two - Track Two

Thursday, March 23<sup>rd</sup>, 2017

3:00 p.m. – 3:30 p.m.

## Green Roofs: Reflections and Predictions

**Presenter:** Jenny Hill, J. Hill/University of Toronto

### Biography



Jen works with Engineers and Landscape Architects, to promote the use of Green Infrastructure in urban environments. She completed her PhD in 2016, having researched local extensive green roof industry practices and having undertaken statistical analyses at the Green Roof Innovation Testing laboratory. In recent years she has presented at IECA Environmental Connections and at the ASCE LID conference, and delivered hydrology courses at the University of Toronto.

### Abstract

The hydrological functions of extensive green roofs are presented through the analysis of field data and by conceptualizing the systems as one of three theoretical structures; reservoir, orifice or evaporation pan. Data from twenty-four green roofs, gathered over twenty-four months (May 2013 - April 2015) and including 176 individual storm events are presented, with statistical interpretation of the design impact on individual rainstorm retention, peak flow rate, and sub-zero seasonal performance. A shorter period of twelve months was used to calculate the potential of the green roofs to evapotranspire excess water, an increasingly common application of an extensive green roof to empty a building integrated cistern or vault storage.

Irrigation is the most important operational factor, with daily programming reducing annual retention by up to 20%. The use of compost in the planting media increases stormwater retention, particularly on an annual basis when snow melt is included. A separate study of thirty-three local green roof installations found that up to a third were constructed using this type of biological material with associated high organic matter content, and higher phosphorous in the discharge water. Overall, the relative phosphorous loading is still low compared with human activities such as flushing the toilet or gardening.

### Learning Objectives

1. How to integrate green roofs into site stormwater plans;
2. The relative benefits of the different green roof components; and
3. What might be expected as a green roof ages.